

Minnesota Department of Public Safety

Office of Pupil Transportation Inspection Manual



Abstract

In 1971, the Departments of Education and Public Safety aligned with a mutual goal of improving and maintaining student transportation safety. As this goal evolved through the years, the State Patrol created the Office of Pupil Transportation based on a 2008 legislative study. The Office was established to create a healthy oversight to carry the goal of safety into the future. The legislative study reiterated the importance of conducting annual, random, and post-crash inspections. The school bus inspection manual – developed and updated with revisions – provides the essential path to compliance with all applicable school bus safety standards.

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School Bus Inspection Manual

Revised January 2026

Contents

Introduction	7
Terminology	9
Vehicle Descriptions	10
Vehicle Registration	12
Driver's License	13
Certification	14
Certificate Types	15
Inspections	17
1. Body	18
1.A. AISLES AND EXITS OBSTRUCTED	18
1.B. BACK-UP CAMERA.....	18
1.C. BODY CONDITION.....	18
1.D. BODY CROSSMEMBERS/FLOOR SILLS.....	18
1.E. CONSTRUCTION.....	19
1.F. DIMENSIONS.....	19
1.G. DOORS: SERVICE ENTRANCE.....	19
1.H. EMERGENCY EXITS	20
1.I. FENDERS (FRONT)	24
1.J. FLOOR CONSTRUCTION.....	24
1.K. HANDRAIL(S).....	25
1.L. HAZARDOUS PROTUBERANCE/SHARP EDGE(S)	25
1.M. INSTRUMENTS AND INSTRUMENT PANEL.....	26
1.N. INSULATION	27
1.O. INTERIOR CLEANLINESS/LOOSE OBJECTS	27
1.P. METAL TREATMENT	27
1.Q. MIRRORS.....	28

School Bus Inspection Manual

Revised January 2026

1.R.	MOBILE DATA DEVICE (OPTIONAL).....	28
1.S.	PASSENGER ADVISORY SYSTEM (OPTIONAL).....	29
1.T.	RUB RAILS.....	29
1.U.	SEATING DESIGN & INSTALLATION / SEAT BELTS.....	29
1.V.	SIDE SKIRTS.....	31
1.W.	STEPS.....	31
1.X.	STORAGE COMPARTMENT.....	32
1.Y.	SUN SHIELD.....	32
1.Z.	TWO-WAY COMMUNICATION.....	32
1.AA.	UNDERCOATING.....	32
1.BB.	VENTILATION, HEATING AND COOLING SYSTEMS.....	33
1.CC.	WHEEL HOUSING.....	35
1.DD.	WINDOWS AND WINDOW GLASS (STANDARD).....	35
2.	Brakes.....	38
2.A.	BRAKES: GENERAL.....	38
2.B.	BRAKES: AIR (DESIGN STANDARD).....	39
2.C.	BRAKES: HYDRAULIC.....	42
2.D.	PARKING/EMERGENCY BRAKE SYSTEM.....	44
3.	Chassis.....	45
3.A.	BODY MOUNTING.....	45
3.B.	BUMPERS.....	45
3.C.	DIFFERENTIAL.....	46
3.D.	DRIVESHAFT.....	46
3.E.	ELECTRICAL SYSTEM.....	47
3.F.	ENGINE.....	51
3.G.	EXHAUST SYSTEM.....	51
3.H.	FRAME.....	52

School Bus Inspection Manual

Revised January 2026

3.I.	FUEL SYSTEM	53
3.J.	STEERING	54
3.K.	SUSPENSION SYSTEM STANDARD	56
3.L.	TIRES	57
3.M.	TOWING ATTACHMENT POINTS	59
3.N.	TRAILER HITCH RECEIVER	59
3.O.	TRANSMISSION (FOR INTERNAL COMBUSTION ENGINES ONLY)	59
3.P.	WHEEL BEARINGS/HUBS	59
3.Q.	WHEEL FASTENERS	60
3.R.	WHEELS	60
4.	Color	61
4.A.	BUSES MANUFACTURED BEFORE JAN. 1, 1995 SEE MN RULES 1993, CHAPTER 3520.	61
4.B.	BUSES MANUFACTURED AFTER DEC. 31, 1994	61
5.	Lamps and Signals	62
	EXTERIOR	62
5.A.	HEADLAMPS	62
5.B.	TURN SIGNALS	62
5.C.	VEHICULAR HAZARD WARNING SIGNAL FLASHER LAMPS	62
5.D.	CLEARANCE LAMPS	62
5.E.	IDENTIFICATION LAMPS	63
5.F.	STOP-ARM LAMP SYSTEM	63
5.G.	SIDE MARKER LAMP(S)	63
5.H.	REFLEX REFLECTOR(S)	63
5.I.	STROBE LAMP	64
5.J.	TAIL/STOP LAMPS	64
5.K.	BACKUP LAMP	64

School Bus Inspection Manual

Revised January 2026

5.L.	LICENSE PLATE LAMP	64
5.M.	PARKING LAMPS	64
5.N.	STOP LAMP (HIGH MOUNT)	64
	INTERIOR.....	65
5.O.	HEADLAMP DIMMER SWITCH	65
5.P.	HIGH BEAM HEADLAMP INDICATOR	65
5.Q.	TURN SIGNAL/HAZARD FLASHER INDICATOR	65
5.R.	BRAKE SYSTEM INDICATOR LAMP(S)	65
5.S.	OTHER REQUIRED INDICATOR LAMPS	65
5.T.	EIGHT-LAMP SYSTEM INDICATOR.....	65
5.U.	INTERIOR LAMPS	65
5.V.	STEPWELL LAMP.....	65
5.W.	BACK-UP WARNING ALARM	66
5.X.	HORN.....	66
5.Y.	LAMPS/SIGNALS INSPECTION PROCEDURE	66
6.	Lettering and Markings	67
6.A.	EV IDENTIFICATION LABEL	67
6.B.	FUEL SYSTEM (LPG)	67
6.C.	NOTICE OF RECORDING DEVICES	67
6.D.	PROHIBITED LETTERING.....	67
6.E.	SCHOOL BUS SIGNS	68
6.F.	SCHOOL BUS IDENTIFICATION; OTHER REQUIREMENTS	68
6.G.	SCHOOL BUS IDENTIFICATION (OPTIONAL).....	68
6.H.	TAX EXEMPT BUSES	69
6.I.	REFLECTIVE MATERIAL.....	69
7.	Safety Equipment	71
7.A.	BODY FLUID CLEANUP KIT	71

School Bus Inspection Manual

Revised January 2026

7.B.	FIRST AID KIT.....	72
7.C.	FIRE EXTINGUISHER.....	73
7.D.	SEAT BELT CUTTER.....	73
7.E.	TRIANGLE WARNING DEVICES.....	73
7.F.	FIRE SUPPRESSION SYSTEMS (OPTIONAL).....	73
7.G.	EMERGENCY EQUIPMENT INSPECTION PROCEDURE.....	73
8.	Student Pedestrian Safety.....	74
8.A.	CROSSING CONTROL ARM.....	74
8.B.	SCHOOL BUS SIGNAL LAMPS (EIGHT LAMP WARNING SYSTEM).....	74
8.C.	STOP-ARM SYSTEM.....	75
8.D.	OPTIONAL SYSTEMS.....	76
9.	Specially Equipped School Buses.....	78
9.A.	AISLES.....	78
9.B.	IDENTIFICATION (INTERNATIONAL SYMBOL).....	78
9.C.	OCCUPANT RESTRAINT.....	78
9.D.	POWER LIFT REQUIREMENTS.....	79
9.F.	SPECIAL SERVICE ENTRANCE.....	81
9.G.	SPECIAL SERVICE ENTRANCE DOOR(S).....	81
9.H.	SUPPORT EQUIPMENT AND ACCESSORIES.....	82
9.I.	WHEELCHAIR TIE DOWN AND OCCUPANT RESTRAINT SYSTEM.....	83
9.J.	SPECIALLY EQUIPPED BUS INSPECTION PROCEDURE.....	84
10.	Type III School Bus.....	86
10.A.	BODY FLUID CLEANUP KIT.....	86
10.B.	FIRE EXTINGUISHER.....	86
10.C.	FIRST AID KIT.....	86
10.D.	EQUIPMENT LOCATION LABEL.....	86
10.E.	LETTERING AND MARKINGS.....	86

School Bus Inspection Manual

Revised January 2026

10.F. MIRRORS.....	87
10.G. PROHIBITED EQUIPMENT.....	87
10.H. VEHICLE AGE.....	87
10.I. VEHICLE COLOR.....	87
11. Out Of Service Criteria	88
BODY EXTERIOR.....	89
BODY INTERIOR.....	89
BRAKE SYSTEM(S).....	90
BUMPERS.....	92
CHASSIS/FRAME.....	92
DIFFERENTIAL.....	92
DRIVESHAFT/DRIVELINE.....	92
ELECTRICAL/HIGH VOLTAGE.....	93
ELECTRICAL/LOW VOLTAGE BATTERY.....	94
EMERGENCY EQUIPMENT.....	94
EMERGENCY EXITS.....	94
ENGINE.....	95
EXHAUST SYSTEM.....	95
FUEL SYSTEM.....	95
LAMPS/SIGNALS.....	96
MIRRORS (571.111).....	96
SPECIALLY-EQUIPPED VEHICLES.....	97
STEERING SYSTEM.....	98
SUSPENSION COMPONENTS.....	99
TIRES/WHEELS/HUBS.....	100
WINDOWS.....	101
WINDSHIELD WIPERS.....	101

School Bus Inspection Manual

Revised January 2026

Introduction

This manual is an in-depth guide for navigating the requirements a school bus dealer, school district, school bus contractor, and State Patrol school bus inspector must use to ensure the safety of all school buses operated within the state of Minnesota. State statutes and rules, along with federal laws, govern school bus design, manufacture and operation for the purpose of assuring the safe transportation of schoolchildren.

The Department of Public Safety has the primary responsibility for school transportation safety. To oversee school transportation safety, the commissioner of public safety or the commissioner's designee shall serve as director of pupil transportation. The law assigns the responsibility of annual school bus inspections to the Minnesota State Patrol.

This manual was established in accordance with [Minnesota Statutes, section \(MSS\) 169.4501, subdivision 3](#), requiring the State Patrol to develop inspection procedures based on the national standards and Minnesota standards adopted by applicable state statutes. The State Patrol uses the manual as the basis for inspecting buses as provided in [MSS 169.451](#).

Chapters 1 through 10 contain the school bus standards and inspection procedures that apply to Types A, B, C, D and Type III school buses, along with multi-function school buses. In Chapter 11, you will find the School Bus Recommended Out-of-Service Criteria from the most recent edition of the National School Transportation Specifications and Procedures adopted by the National Congress on School Transportation.

The manual is organized predominately in alphabetical order, with the exception of standards, which are presented first. The standard acts as the overarching authority related to a given component. Sources are cited throughout the manual, with an exception: The majority of the school bus standards are adopted from the National School Transportation Specifications and Procedures (NSTSP). If a particular chapter/section is absent of any state or federal law citation, it is safe to assume the source is the NSTSP adopted through [MSS 169.4501](#). If multiple laws (state or federal) are cited, [MSS 169.4501](#) will also be cited (when applicable) to ensure the reader has a full comprehension of the applicable law(s)/standard(s).

The manual is organized in an outline format. The order is number, letter, number and so forth. Reading left to right, the first number indicates the chapter, followed by the section letter and paragraph number(s). This designation will mirror the violation code on the Driver/Vehicle Examination Report (DVER) when an equipment deficiency is documented.

The National Congress on Student Transportation updates the NSTSP every five years. The state legislature adopted the NSTSP as listed.

Session	Effective Date	Session	Effective Date
1990	January 1, 1995	2010	January 01, 2013
1995	January 01, 1998	2015	July 01, 2017
2000	November 01, 2004	2020	No session
2005	January 01, 2008	2025	August 01, 2026

School Bus Inspection Manual

Revised January 2026

Effective dates varied prior to 2017, at which time the Minnesota legislature amended [MSS 169.4501, subdivision 2\(b\)](#), which now states the standards apply to school buses manufactured after Aug. 1 of the year following a year in which a revised edition of the NSTSP is adopted. Buses complying with the standards when manufactured need not comply with standards established later, except as specifically provided for by law.

[MSS 169.4501, subdivision 2\(c\)](#) states a school bus manufactured on or before the date provided by paragraph (b) must conform to the Minnesota standards in effect on the date the vehicle was manufactured, except as specifically provided for in law.

For complete statutory or rule language, review the applicable laws/rules below.

❖ State Law/Rule:

- [MSS 168](#) – Registration Highway Traffic Regulation Act
- [MSS 169](#) – Traffic regulations
- [MSS 171](#) – Driver’s license law
- [MSS 299A](#) – Wheelchair securement devices
- [MN Rule 7470](#) - School bus operations adopted pursuant to [MSS 169.449](#)
- [MN Rule 7414](#) – School bus driver qualifications

❖ Federal Law:

- [49 CFR 571](#) (FMVSS) – establishes manufacturing standards for vehicles
- [49 CFR 570](#) – establishes vehicles inspections standards

School Bus Inspection Manual

Revised January 2026

Terminology

ANSI American National Standards Institute

CFR Code of Federal Regulations

CVSA Commercial Vehicle Safety Alliance

DVER Driver/Vehicle Examination Report

FMVSS Federal Motor Vehicle Safety Standards

When searching for the actual FMVSS regulation, you'll find FMVSS filed under Title 49 of the Code of Federal Regulations in Chapter 571, followed by the section number. An example is wheelchair lift requirements – 49 CFR 571.403. When cited in this manual, it will be listed as FMVSS 403.

GVWR Gross Vehicle Weight Rating

MFSAB Multi-Function School Activity Bus

MSS Minnesota State Statute

NCST National Congress on Student Transportation

NSBY National School Bus Yellow

NSTSP National School Transportation Specifications and Procedures

OEM Original Equipment Manufacturer

SAE Society of Automotive Engineers

SBIM School Bus Inspection Manual

SBMTC School Bus Manufacturers Technical Council

WTORS Wheelchair Tiedown and Occupant Restraint System

School Bus Inspection Manual

Revised January 2026

Vehicle Descriptions

A school bus ([MSS 169.011, subdivision 71](#)) means a motor vehicle used to transport pupils to or from a school defined in [MSS 120A.22](#), or to or from school-related activities, by the school or a school district, or by someone under an agreement with the school or a school district. A school bus does not include a motor vehicle transporting children to or from school for which parents or guardians receive direct compensation from a school district, a motor coach operating under charter carrier authority, a transit bus providing services as defined in [MSS 174.22, subdivision 7](#), or a vehicle otherwise qualifying as a Type III vehicle under paragraph 5, when the vehicle is properly registered and insured and being driven by an employee or agent of a school district for nonscheduled or non-regular transportation. A school bus may be a Type A, B, C, D, or Type III as follows:

1. Type A School Bus

This is a van conversion or bus constructed on a van-type or cutaway front section vehicle with a left-side driver's door. This definition includes two Type-A classifications:

- ❖ Type A-I has a GVWR of 14,500 lbs. or less.
- ❖ Type A-II has a GVWR greater than 14,500 lbs. but less than 21,501 lbs.



❖ Type B School Bus

This is constructed utilizing a stripped chassis. The entrance door is behind the front wheels. This definition includes two classifications: type B-I, with a GVWR less than or equal to 10,000 pounds; and type B-II, with a GVWR greater than 10,000 pounds.



2. Type C School Bus

This is constructed using a chassis with a hood and front fender assembly. The entrance door is behind the front wheels. It also includes a cutaway truck chassis or truck chassis with cab, with or without a left side door, and has a GVWR greater than 21,500 lbs.



3. Type D School Bus

Large, transit-style bus with an entrance door in front of the front wheels. The engine is not located in front of the windshield, and is often in the rear.



School Bus Inspection Manual

Revised January 2026

4. Type III Vehicle

This type of vehicle is restricted to passenger vehicles and buses having a maximum manufacturer's rated seating capacity of 10 or fewer people, including the driver, and a GVWR of 10,000 lbs. or less. A Type III vehicle must not be outwardly equipped and identified as a Type A, B, C, or D school bus. A van or bus converted to a seating capacity of 10 or fewer people must have been originally manufactured to comply with the passenger safety standards.

Vehicles model year 2007 or older must not be used as type III vehicles to transport school children, except those vehicles that are manufactured to meet the structural requirements of federal motor vehicle safety standard 222, Code of Federal Regulations, title 49, part 571.



5. Head Start Bus

Per MSS 169.011, subdivision 34, Head Start bus means a motor vehicle used to transport children and parents to or from a Head Start facility, or to or from Head Start-related activities, by the Head Start grantee, or by someone under an agreement with the Head Start grantee. A Head Start bus may be a type A, B, C, or D bus.

A Head Start bus manufactured after December 31, 1994, must meet the same standards as a type A, B, C, or D school bus, except that a Head Start bus is not required to be equipped with the warning signals required for a school bus. A Head Start bus that is not equipped as a school bus must be painted colors other than national school bus yellow.

A type III vehicle cannot be used as a Head Start bus.

6. Multi-Function School Activity bus (MSFAB)

A "multi-function school activity bus" is a school bus that meets the definition of a multifunction school activity bus in Code of Federal Regulations, title 49, section 571.3. A vehicle that meets the definition of a type III vehicle is not a multifunction school activity bus.

School Bus Inspection Manual

Revised January 2026

Vehicle Registration

Types B, C and D Buses

Types B, C and D school buses may be registered in any of the following applicable classes: school bus (SB), bus (BY), tax-exempt or apportioned.

For first-time use, a pre-registration certificate is required as outlined on page 14 under [Certification](#). Tax-exempt plates require the name of the political subdivision on both sides of the bus as required by [MSS 168.012](#). Bus license plates (BY) require the name of the charter operator displayed on both sides of the power unit as required by [MSS 221.031, subdivision 6](#) when conducting charter operations.

Charter/Non School Bus Transportation

Buses used on charter/non-school bus transportation trips must have bus (BY) or apportioned (AP) license plates and conform to lettering requirements including the covering of the word "school" in school bus. Buses with passenger or apportioned license plates must conform to the federal equipment requirements. Tax-exempt plates may only be used by the school district that owns the school buses to provide their own transportation. Contractors are prohibited from using tax-exempt license plates.

School buses are exempt ([MSS 221.025](#)) from the motor carrier of passengers permit ([MSS 221.0252](#)), provided all the following criteria are met:

1. The passengers are students.
2. The students are going to or from school-sponsored activities.
3. The bus is a school bus that has been inspected and certified as a school bus by the State Patrol pursuant to [MSS 169.451](#).

A charter trip means carrying passengers other than students/non-school functions. Charter trips require operating authority and are subject to all Minnesota Motor Carrier laws under [MSS 221](#) and rules adopted therein – Exception [MSS 123B.88 subdivision 9](#).

A school bus providing transportation across state lines is subject to all Federal Motor Carrier Safety regulations ([49 CFR, Parts 390-399](#)), unless transporting only schoolchildren and/or school personnel from home to school and from school to home.

Type A Buses

Requirements for Type A school buses are the same as those for Types B, C and D, except that those with a manufacturer's rated capacity of 15 passengers or fewer including the driver may not register as a bus (BY). Those used in charter operations must register in the passenger car class.

Type III Buses

A Type III bus can only be registered in the following registration classes:

1. Tax exempt: Those of political subdivisions.
2. School bus (SB): Those vehicles used exclusively for student transportation.
3. Passenger automobile license plates.
4. Bus Plates (BY): Every motor vehicle certified by the Department of Transportation as a special transportation service provider vehicle and receiving reimbursement as provided in [MSS 256B.0625, subdivision 17](#), and used a Type III bus.

School Bus Inspection Manual

Revised January 2026

Driver's License

A class A or B commercial driver's license (CDL) with school bus and passenger endorsements are required when driving a school bus with a GVWR of 26,001 lbs. or more. A properly endorsed class C CDL is required when the GVWR is less than 26,001 lbs., but the manufacturer's rated seating capacity is 16 or more, including the driver. A driver must be medically qualified as required by [MSS 171.321, subdivision 2](#).

Type A Buses

One of two licenses will be required when operating a Type A-I or Type A-II school bus. This is dependent on the transportation use.

1. A class D license is permissible when driving a Type A-I school bus. The school bus must be used exclusively as an activities bus meeting the requirements of [MSS 171.02, subdivision 2\(a\)](#). This includes a manufacturer's rated capacity of 15 passengers or fewer, including driver, and a GVWR of 14,500 lbs. or less.
2. A minimum of a class C license with a school bus endorsement is required when driving a Type A-II school bus. It is required when providing home-to-school or school-to-home transportation.

Type III Buses

A class D driver's license is required for a driver of a Type III school bus. The driver must meet the requirements outlined in [MSS 171.02, subdivision 2\(b\)](#).

School Bus Inspection Manual

Revised January 2026

Certification

A school bus shall not be used to transport students unless it displays a current annual or interim certificate.

A chassis manufacturer shall certify that the product meets Minnesota standards. All buses with a certified manufacturing date prior to April 1, 1977, shall not be recertified as a school bus after January 1, 1996.

Upon request, a body manufacturer or school bus dealer must provide preliminary certification to the Department of Public Safety that the product meets Minnesota standards.

New School Buses—Types A, B, C and D

A pre-registration certificate is required of a new school bus being registered for the first time in Minnesota. The two-part form required by [MSS 168.102](#) must state the school bus complies with Minnesota school bus standards. Part one applies to the chassis dealer, and part two applies to the body dealer. The body dealer may certify both the school bus chassis and body by signing both forms if they so choose.

Used School Buses—Types A, B, C and D

A used school bus that is sold to be put into service in Minnesota, must conform to the school bus standards in effect on the date of manufacture.

If a school bus certificate is not present or is expired, the State Patrol must inspect and certify the school bus meets the applicable minimum school bus standards for design, color and equipment before issuing a certificate.

Type III

A Type III vehicle put into service as a school bus must obtain an interim inspection from a dealer or be certified by the State Patrol before first use.

Broken Windshields or Damaged Stickers

If a certificate becomes damaged, or a windshield must be replaced, contact the regional inspector and provide them with the vehicle information and a new certificate will be supplied.

School Bus Inspection Manual

Revised January 2026

Certificate Types

Interim Certificate

The interim certificate is issued to an authorized school bus dealer for placement on a new school bus or buses operated in Minnesota.

The dealer must certify to the state of Minnesota by means of a pre-registration certificate, before registration plates are issued, that the bus meets Minnesota Minimum School Bus Standards. The interim certificate (Fig. 1) is placed on the lower left front corner of the windshield. The interim certificate must include the date of inspection and must be valid until the owner's next scheduled annual inspection, but must not be valid for more than 12 months following the month of initial inspection.

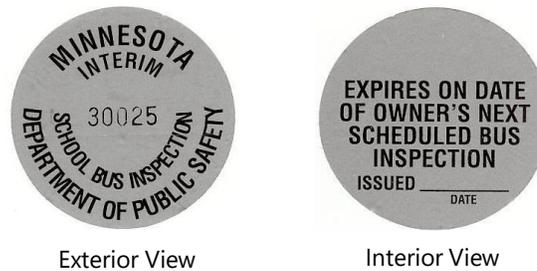


Figure 1

Rejection Sticker

A school bus on which has been discovered one or more defects described in the NSTSP out of service criteria, shall be deemed unsafe for the transportation of school children. A rejection sticker (Fig. 2) will be placed on the lower left corner of the windshield. The sticker shall be removed only upon authorization from a member of the State Patrol who has determined that all defects have been corrected. Pending re-inspection and certification of the vehicle by a member of the State Patrol, a bus bearing a rejection sticker may be used to transport students for up to 30 days provided the defects have been corrected and the vehicle examination report is signed by the owner or a designee certifying that all defects have been corrected. The signed report shall be carried in the first aid kit on the bus.

A defect discovered during an inspection that was identified during a previous inspection but has not been corrected results in a failed inspection. A rejection sticker shall be affixed to the lower left corner of the windshield.



Figure 2

School Bus Inspection Manual

Revised January 2026

School Bus and Wheelchair Securement Device Certificate

A school bus that has had an inspection completed in which no out-of-service defects were identified is deemed to have passed the inspection and an inspection certificate (Fig. 3) shall be affixed to the lower left corner of the windshield. All defects identified must be repaired within 14 days of the inspection. The person completing the repairs shall sign and date the inspection report indicating the repairs were made. The inspection report must be retained at the principal place of business of the carrier or school district for 12 months following the inspection and must be available for review by a representative of the commissioner of public safety.

If applicable, the inspector will indicate the number of approved wheelchair securement device(s). If additional securement devices are placed in the vehicle, the vehicle must be re-inspected to ensure the devices meet the inspection criteria.

Inspection month

Inspection Type section

Number of approved wheel chair positions

JAN	MINNESOTA						JUL	
FEB	STATE PATROL						AUG	
MAR	COMMERCIAL VEHICLE INSPECTION PROGRAM						SEP	
APR	INSPECTED IN MONTH SPECIFIED						OCT	
MAY	2026						NOV	
JUN	Serial No.	SAMPLE					DEC	
<ul style="list-style-type: none"> School Bus Inspection Pursuant to 169.451 Wheel Chair Mobility Aid Inspection Pursuant to 299A.14, vehicle is approved for the number of wheel chair positions indicated below 								
1	2	3	4	5	6	7	8	9
DO NOT DUPLICATE UNDER PENALTY OF LAW								

Figure 3

School Bus Inspection Manual

Revised January 2026

Inspections

Scheduled

All school buses will be inspected on an annual basis by the State Patrol pursuant to [MSS 169.451](#). School bus inspectors shall schedule annual inspections with school districts and fleet operators, as well as re-inspections to verify correction of deficiencies.

Unscheduled

Inspectors may conduct unscheduled or unannounced spot checks of any school bus at the location where a bus is kept when not in operation. All such inspections will be completed in accordance with [MSS 169.451](#).

Roadside

Unannounced destination/roadside inspections may be conducted. One or more defects that would render the vehicle out of service during an annual inspection will not place the school bus out of service, unless a similar defect is listed in the Commercial Vehicle Safety Alliance (CVSA) out-of-service criteria. School buses should be inspected at a safe location.

Inspection Criteria

All inspections will be performed in accordance with this manual. Established criteria should be followed to assure uniform inspections statewide. Updates to the manual will be issued as needed by law changes, new products or interpretations. The manual is designed to indicate the criteria and procedures for all inspections. When there are definitive changes to a standard, the manual indicates criteria for before and after the effective date. In general, buses will meet the criteria effective on the date of manufacture. This does not prohibit updating older buses to newer standards, provided the update does not lessen the prevailing standard at time of manufacture.

Rule or Law Interpretation

Questions of laws, rules, inspection procedures or inspection criteria may be presented to the area school bus inspector, chief inspector or state pupil transportation safety director.

First Time Inspection

During the first-time inspection by the State Patrol or a school bus dealer, each item will be checked for conformity to the school bus design standards in [MSS 169.4501 through 169.4504](#) or [169.454](#). The first-time inspection criteria will be based on a certified/not certified designation. All items found to be non-compliant must be corrected before a certificate is issued. A school bus must not be used until it displays either a current interim or annual certificate.

School Bus Inspection Manual

Revised January 2026

1. Body

Item/Method of Inspection

1.A. Aisles and Exits Obstructed

- ❖ MSS [169.447](#) and [169.4501](#)
- ❖ [FMVSS 217](#)

- A. All emergency exit doors shall be accessible by a 12-inch minimum aisle. The aisle shall not be obstructed at any time by any type of barrier, such as a wheelchair or tie-down, cargo or seat. A flip-up seat in the unoccupied/raised position shall not obstruct the 12-inch minimum aisle to any side emergency exit door. The track of a track seating system is exempt from this requirement.
- B. An emergency door opening must be a minimum of 24 inches wide by 45 inches high for Types B, C and D, and 22 inches wide by 45 inches high for a Type A school bus.

1.A.1. Aisles and Exit Obstruction Inspection Procedure

- A. Inspect the aisle to ensure that all aisles, including aisle (or passageway between seats) leading to emergency door are a minimum of 12 inches
- B. Inspect to ensure that there are no obstructions in an aisle that would prevent passengers from accessing egress or emergency exits
- C. On school buses with a side emergency door, check that aisle space from center aisle to side of emergency door is 12 inches by measuring between the vertical line of the seat back and the face of the next seat cushion or bottom of a flip seat;
- D. On buses equipped with flip up seats, inspect to ensure the seat cushion rises to a vertical position automatically when not occupied.

1.B. Back-Up Camera

A back-up camera may be installed to view the area of restricted visibility to the rear of the bus. If installed:

- A. The back-up camera shall only activate when the bus is in reverse.
- B. The monitor to view the back-up camera video:
 1. May be integrated into the interior rearview mirror, or;
 2. May be integrated as part of the dashboard.

1.C. Body Condition

- A. Visually inspect the body exterior to ensure that there is not any panel, access door(s), rub rail or trim that is loose, torn, dislocated or protruding from the surface of the bus that creates a hazard.
- B. All engine, battery or other doors must be securely mounted and properly installed.

1.D. Body Crossmembers/Floor Sills

- A. Inspect the underside of the body for damaged floor sills/body cross members, outrigger or other structural body supports.
- B. Inspect any area of the floor that is sagging, weak or damaged due to broken, damaged or loose body crossmembers.

School Bus Inspection Manual

Revised January 2026

1.E. Construction

- ❖ MSS 169.69 and 169.4501
- A. Side Intrusion Test: Per NSTSP at time of manufacture.
- B. Construction shall be reasonably dustproof and watertight.
- C. Every motor vehicle shall at all times be equipped with such parts (i.e., gasket) and equipment so arranged and kept in such state of repair as to prevent carbon monoxide from entering the interior of the vehicle.
- D. All openings in the floorboard or firewall between the chassis and passenger compartments, such as for gearshift lever and auxiliary brake lever, shall be sealed.

1.F. Dimensions

A. Interior Height

The inside body height must provide for 72 inches of headroom, measured metal to metal, at any point on the longitudinal centerline from front vertical bow to rear vertical bow. The inside body height of a Type A bus shall be 62 inches or more. Inside height measurement does not apply to air conditioning equipment.

Inside headroom measurement should be at least 71 ¼ inches measured at the centerline of the bus. Inside headroom measurement for a Type A bus should be at least 61 ¼ inches measured at the centerline of the bus.

B. Length and Width

A school bus shall not exceed 45 feet in length, nor exceed 102 inches (8 ½ feet) in width. Accessories such as mirrors, stop-arm(s), or other non-permanent body components/accessories are not included in the dimension's requirement.

C. Passenger Load

1. Actual gross vehicle weight (GVW) is the sum of the chassis weight plus the body weight, plus the driver's weight, plus total seated student weight. For purposes of calculation, the driver's weight is 150 pounds and the student weight is 120 pounds per student.
2. Actual GVW shall not exceed the chassis manufacturer's GVWR for the chassis, nor shall the actual weight carried on any axle exceed the chassis manufacturer's Gross Axle Weight Rating (GAWR).

1.G. Doors: Service Entrance

- A. The entrance door shall be under the driver's control, designed to afford easy release and to provide a positive latching device on manual operating doors to prevent accidental opening. When a hand lever is used, no part shall come together that will shear or crush fingers. Manual door controls shall not require more than 25 pounds of force to operate at any point throughout the range of operation, as tested on a 10 percent grade, both uphill and downhill (see [1.H.2, Emergency Door Requirements](#) if door is inoperable).
 - B. The primary entrance door shall be located on the right side of the school bus, opposite and within direct view of the driver.
 1. In addition, buses may be equipped with a left-side entrance door located immediately behind the driver to be used exclusively for curbside loading/unloading on one-way streets.
-

School Bus Inspection Manual

Revised January 2026

2. Buses equipped with a left-side entrance door shall have a mirror mounted in the upper right corner of the interior of the bus so as to provide a clear view of the left side entrance door and stepwell.
- C. All Type A school buses manufactured on or after Jan. 1, 2008, and all Types B, C and D school buses shall have an entry door with a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches. Type A school buses manufactured prior to Jan. 1, 2008, shall have a minimum opening area of 1,200 square inches.
- D. Buses manufactured on or after Jan. 1, 2008 shall have a split-type door that shall open outward.
- E. School buses manufactured prior to Jan. 1, 2008 may have a split- or jackknife-type service door. If a split-type door is used, the front section must open outward.
- F. On power-operated entrance doors, the emergency release valve, switch or device to release the entrance door must be placed above or to the immediate left or right of the entrance door and must be clearly labeled. The emergency release valve, switch or device shall work in the absence of power (see [1.H.2, Emergency Door Requirements](#) if door is inoperable).
- G. Vertical closing edges shall be equipped with a flexible material to protect children's fingers. Type A school buses manufactured prior to Jan. 1, 2008 may be equipped with a chassis manufacturer's standard door.
- H. All entrance door glass shall be approved safety glass. The bottom of each lower glass panel shall not be more than 10 inches from the top surface of the bottom step. The top of each upper glass panel when viewed from the interior shall be not more than 3 inches below the interior door control cover or header pad (see [1.Y, Windows and Window Glass](#)).
- I. School buses manufactured after Dec. 31, 1994 shall have all door openings equipped with padding at the top edge of the opening. Padding shall be at least 3 inches wide and 1 inch thick and extend the full width of the door opening.
- J. All exterior metal door hinges shall be designed to allow lubrication to be channeled to the center 75% of each hinge loop without disassembly, unless they are constructed of stainless steel, brass or non-metallic hinge pins or other designs that prevent corrosion.

1.G.1. Door Inspection Procedure:

Visually inspect and operate entrance door and inspect door to ensure it properly opens and closes without any obstruction of movement. Inspect manually operated door to make sure door will maintain an open and closed position. Door shall not have any locking device except for interlock systems. On power-operated entrance doors, the emergency release valve, switch, or device to release the entrance door must be placed above or to the immediate left or immediate right of the entrance door and must be clearly labeled.

1.H. Emergency Exits

- A. All emergency exits must meet the requirements of FMVSS 217. However, refer to the design standard (NSTSP) applicable at the time of manufacture for the required number of emergency exits.
 - B. For buses manufactured on or after January 01, 2013, use the following tables to determine the required number and types of emergency exits to comply with this specification, based on the bus manufacturer's equipped seating capacity.
 1. Use **Table 1** if the bus contains a rear emergency door.
-

School Bus Inspection Manual

Revised January 2026

2. Use **Table 2** if the bus contains a rear pushout emergency window AND a left side emergency door, as required by [FMVSS 217](#) for school buses without a rear emergency door.
3. When using either Table 1 or Table 2:
 - a. Enter the table at the appropriate capacity and select the desired row from the options for that capacity.
 - b. A school bus will meet the requirements of this specification and the requirements of [FMVSS 217](#) if it contains the types and quantities of emergency exits listed on the row selected.
- C. The exposed area of the upper panel of emergency doors shall be a minimum of 400 square inches of approved safety glazing. If installed, all other glass panels on emergency doors shall be approved safety glazing.

Buses with Rear Emergency Door (All Front Engine Buses)					
Available Combination By Capacity	Manufacturers Equipped Capacity	Shall Have	And Shall Have		
		Roof Hatch	L. Side Emerg. Exit Windows	L. Side Emerg. Exit Windows	L. Side Emerg. Exit Door
1-45	1-45	1	0	0	0
46-77	46-77	2	1	1	0
	46-77	2	0	0	1
78-93	78-93	2	2	2	0
	78-93	2	1	1	1

Table 1

Buses with Rear Pushout Window and Left Side Emergency Door (All Rear Engine Buses)					
Available Combination By Capacity	Manufacturers Equipped Capacity	Shall Have	And Shall Have		
		Roof Hatch	L. Side Emerg. Exit Windows	L. Side Emerg. Exit Windows	L. Side Emerg. Exit Door
1-45	1-45	1	0	0	0
46-89	46-89	2	1	1	0
	46-89	2	0	0	1
90-105	90-105	2	2	2	0
	90-105	2	1	1	1

Table 2

1.H.1. Emergency Exit Identification/Lettering

- ❖ [FMVSS 217 S5.5.3](#) and [S5.5.9](#)

Each school bus emergency exit shall have the designation "Emergency Door" or "Emergency Exit," as appropriate, in letters at least 5 cm, (1.97 in) high, of a color that contrasts with its background.

A. Doors

For emergency exit doors, the designation shall be located at the top of, or directly above, the emergency exit door on both the inside and outside surfaces of the bus.

B. Roof Exits

The designation for roof exits shall be located on an inside surface of the exit, or within 30 centimeters of the roof exit opening.

C. Windows

For emergency window exits, the designation shall be located at the top of, or directly above, or at the bottom of the emergency window exit on both the inside and outside surfaces of the bus.

School Bus Inspection Manual

Revised January 2026

Concise operating instructions describing the motions necessary to unlatch and open the emergency exit shall be located within 6 inches of the release mechanism on the inside surface of the bus. These instructions shall be in letters at least 1 cm, (.39 in) high and of a color that contrasts with its background.

Each opening for a required emergency exit shall be outlined around its outside perimeter with a retroreflective tape with a minimum width of 2.5 centimeters and either red, white, or yellow in color.

1.H.2. Emergency Door Requirements

❖ [FMVSS 217](#)

❖ [SBIM 1. A.](#)

- A. A school bus must have a rear emergency door exit. It shall be located within the center of the rear end, or the rear half on the left side.
- B. The emergency door opening must be a minimum of 24 inches wide by 45 inches high by 12 inches deep. A side emergency door must be a minimum of 24 inches wide by 45 inches high, but there must be a 12-inch aisle between the rearmost edge of the door opening and the rear surface of a seat back.

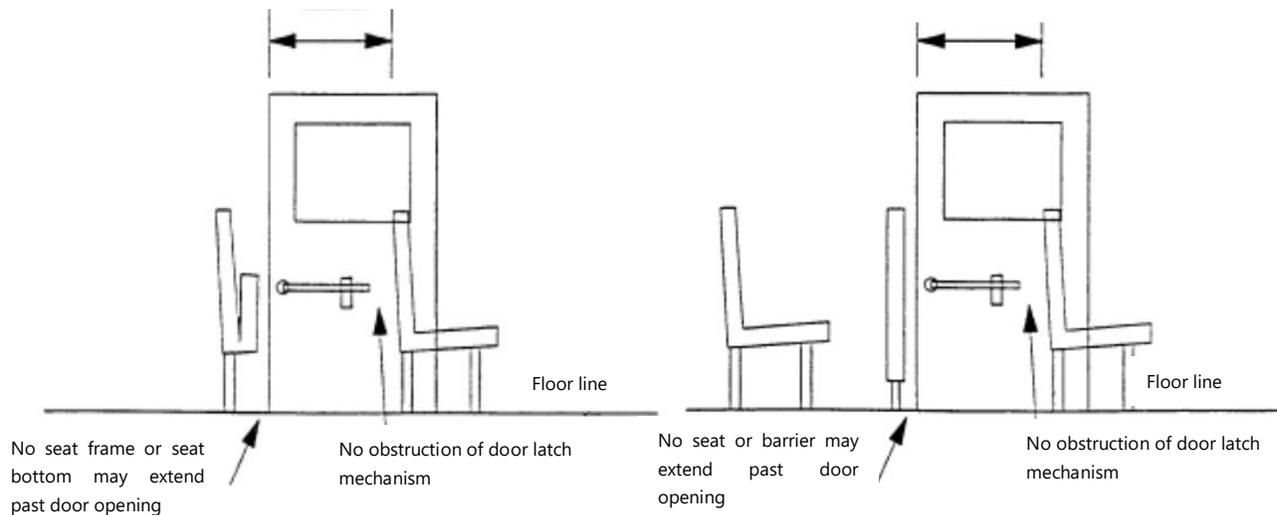


Figure 4

- C. When opening the rear emergency door from the inside, it must open to the left. If opening a side emergency door from the inside, it must open to the right. Either emergency door must open outwardly and must have an interior label displaying operational directions.
- D. A seat bottom may be located within the area of a side emergency exit door if the seat bottom pivots and automatically assumes and retains a vertical position when not in use – see paragraph B illustration of this section.
- E. Each school bus emergency exit door shall allow manual release of the door by a single person, from both inside and outside the passenger compartment. The release mechanism shall operate without the use of remote controls or tools, and notwithstanding any failure of the vehicle's power system.

School Bus Inspection Manual

Revised January 2026

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- F. A latching device shall be used to hold a door open, preventing the emergency door from closing during an actual emergency or school bus evacuation drill.
 - G. When the release mechanism is not in the position that causes an emergency exit door to be closed, and the vehicle's ignition is in the "on" position, a continuous warning sound shall be audible at the driver's seating position and in the vicinity of the emergency exit door. There must be no steps leading to the emergency door.
 - H. There shall be no obstruction higher than ¼ inch across the bottom of any emergency door opening. Fasteners used within the emergency exit opening shall be free of sharp edges or burrs.
 - I. The service and emergency door may be equipped with vandal locks if they comply with [FMVSS 217](#).
 - J. Required and/or marked emergency exits must not be missing, inoperative (do not open, close and/or secure as designed), or obstructed (see also [SBIM 1.A](#)).

1.H.3. Emergency Window Requirements

- A. The rear emergency window shall have a lifting assistance device that will aid in lifting and holding the rear emergency window open.
- B. Side emergency exit windows, when installed, may be vertically hinged on the forward side of the window. No side emergency exit window will be located above a stop-arm.
- C. When a release mechanism is open and the vehicle's ignition is in the "on" position, a continuous warning shall be audible at the drivers seating position and in the vicinity of that emergency exit.
Note: FMVSS requires a continuous warning at the driver's compartment and in the vicinity of the emergency exit. This means a person must be able to hear a buzzer while standing near the exit window. The buzzing sound does not have emit from the exit itself.
- D. Required and/or marked emergency exits must not be missing, inoperative (do not open, close and/or secure as designed), or obstructed.

1.H.4. Emergency Exit Inspection Procedure

- A. Visually inspect all emergency exits.
 - 1. Operate all emergency exits. Exits must open freely and completely;
 - 2. Door prop rods must operate freely and hold door or exit in open position without obstructing exit;
 - 3. There shall be no padlocks or any other locking devices on exits except interlocking systems;
 - 4. Ensure the vehicle is equipped with the required number of emergency exits based on vehicle design;
 - 5. All exits must be unobstructed. Ensure each exit space meets the required opening size as specified in FMVSS 571.217;
 - 6. If equipped with interlock systems, check the functionality of the system. The bus should not be capable of starting while the interlock is engaged and an alarm should sound. If the
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School Bus Inspection Manual

Revised January 2026

emergency-exit interlock is engaged after a vehicle is running, an audible alarm should be given to alert the driver.

- B. Visually inspect all exits to ensure they are clearly labeled and marked on both the inside and outside of the bus. C. Ensure that all exits have an audible device to alert the driver and occupants in the vicinity of an open exit door or window.

Note: FMVSS 571.217 defines the number of exits for each type of bus.

1.I. Fenders (Front)

- A. When measured at the fender line, the total spread of the outer edges of front fenders shall exceed the total spread of front tires when front wheels are in a straight-ahead position.
- B. Front fenders shall be properly braced and shall not require attachment to any part of the body.

1.J. Floor Construction

❖ MSS [169.4501](#) and [169.4503](#)

- A. The metal floor must be covered with plywood. The plywood must be five-ply nominal $\frac{5}{8}$ inch thick and must equal or exceed properties of exterior-type softwood plywood, grade C-D, as specified in the standard issued by the United States Department of Commerce. All of the plywood's exposed edges must be sealed. Type A-I buses must be equipped with nominal $\frac{1}{2}$ inch thick plywood or an equivalent material that meets the requirements of this subdivision. Equivalent material may be used to replace plywood, provided it has insulation R-value, deterioration, sound abatement and moisture resistance properties that are equal to or exceed the properties of the plywood it is replacing. The floor must be level from front to back and side to side, except in wheel housing, toe board and driver's seat platform areas.
- B. The floor in the under-seat area, including tops of wheel housings, driver's compartment and toeboard, shall be covered with an elastomer floor covering, having a minimum overall thickness of .125 ($\frac{1}{8}$) inch and a calculated burn rate of 0.1 ($\frac{1}{10}$) mm per minute or less, using the test methods, procedures and formulas listed in [FMVSS 302, Flammability of Interior Materials](#). The driver's area and toeboard area in all Type A buses may be manufacturer's standard flooring and floor covering.
- C. The floor covering in the aisles shall be ribbed or other raised pattern elastomer and have a calculated burn rate of 0.1 ($\frac{1}{10}$) mm per minute or less using the test methods, procedures and formulas listed in [FMVSS 302](#). Minimum overall thickness shall be 0.187 ($\frac{3}{16}$) inch measured from tops of ribs.
- D. The floor covering must be permanently bonded to the floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be a type recommended by the manufacturer of floor-covering material. All seams shall be sealed with waterproof sealer.
- E. On Types B, C and D buses, a flush-mounted, screw-down plate that is secured and sealed shall be provided to access the diesel or gasoline fuel tank sending unit and/or fuel pump. This plate shall not be installed under flooring material.

1.J.1. Floor Construction Inspection Procedure

- A. Visually inspect floor covering, aisle and cove molding strips for condition and adhesion. Check fastening holes for cracks, and check condition of rubber in aisle to ensure that there are no unsealed holes or cracks through the underside of the bus and that there is no damage to the coverings that could cause a trip or slip hazard.
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School Bus Inspection Manual

Revised January 2026

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- B. Check for a plywood floor by opening the rear door and observing the rise in the floor area above the metal floor line. Observe levelness of the floor and covering. Seams must be sealed and the covering bonded to the floor. The floor must be covered with an elastomer floor covering. Aisle covering must also be nonskid, wear resistant and ribbed.

1.K. Handrail(s)

Visually and physically inspect handrail installation for proper mounting and structural integrity. Inspect for any condition likely to create a catching or snagging hazard. If a potential hazard is present administer the NHTSA string and nut test (see NSTSP).

1.K.1. Buses Manufactured on or before August 1, 2026

At least one handrail shall be installed. The handrail shall be a minimum of 1 inch diameter and be constructed from corrosion resistant material(s). The handrail(s) shall assist passengers during entry or exit and shall be designed to prevent entanglement, as evidenced by the passing of the NHTSA string and nut test.

1.K.2. Buses Manufactures after August 1, 2026

A handrail shall be installed on the left and right sides of the stepwell. The handrails shall be a minimum of one inch diameter and be constructed from corrosion resistant material(s). The handrails shall assist passengers during entry or exit and shall be designed to prevent entanglement, as evidenced by the passing of the National Highway Traffic Safety Administration (NHTSA) string and nut test.

1.L. Hazardous Protuberance/Sharp Edge(s)

- A. The interior of the bus shall be free of all unnecessary projections, which include luggage racks and attendant handrails, to minimize the potential for injury. This specification requires inner lining on ceilings and walls. If the ceiling is constructed with lap joints, the forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged or otherwise treated to minimize sharp edges. Buses may be equipped with a storage compartment for tools, tire chains and/or tow chains (See BUS BODY AND BODY SPECIFICATIONS, Storage Compartment of NSTSP).
- B. The school bus exterior may not have any torn/broken parts, glass, or other loose or dislocated part(s). No part/object may protrude from the surface of the vehicle that presents a safety hazard.
- C. The school bus interior may not have exposed sharp edges consisting of torn metal parts, moldings, or glass that could injure a student or tear clothing.

1.L.1. Public Address System: Interior

- ❖ MSS [169.4501](#) and [169.4503, subdivision 15](#)

- A. Buses may be equipped with an AM/FM/audio and/or public address system having interior and exterior speakers.
- B. No internal speakers, other than the driver's communication systems, may be installed within four feet of the driver's seat back in its rearmost upright position.
- C. Interior speakers may protrude up to ½ inch from the school bus interior.

1.L.2. Video or Mobile Surveillance Systems

- ❖ MSS [169.4503 subdivision 30](#)

Camera heads for video or mobile surveillance may be mounted in the driver compartment area, mid-bus, or on a rear interior bulkhead in the student passenger area. For buses manufactured or retrofitted

School Bus Inspection Manual

Revised January 2026

with a surveillance system after December 31, 2012, cameras mounted mid-bus must be parallel to a seat back, must not have any sharp edges, must not extend outward more than 3-1/2 inches, and must be located within 24 inches of the top of the side window of the bus. The 24-inch measurement is taken from the top of the window frame and following the roof contour.

1.M. Instruments and Instrument Panel

A. The chassis shall be equipped with the instruments and gauges listed below:

Note: (Telltale warning lamps in lieu of gauges are not acceptable, except as noted).

1. Brake air pressure gauge (air brakes), brake indicator lamp (vacuum/hydraulic brakes), or brake indicator lamps (hydraulic/hydraulic);
2. Fuel gauge (internal combustion engines only);
3. Glow-plug/grid heater indicator (if applicable).
4. High-beam headlamp indicator;
5. Odometer that can be read without using a key and that will give accrued mileage (to seven digits), including tenths of miles, unless tenths of miles are registered on a trip odometer.
6. Oil pressure gauge.
7. Speedometer;
8. Tachometer (internal combustion engines only);

Note: For Types B, C and D buses, a tachometer shall be installed so as to be visible to the driver while seated in a normal driving position.

9. Turn signal indicator;
10. Voltmeter;

Note: An ammeter with graduated charge and discharge indications is permitted in lieu of a voltmeter; however, when used, the ammeter wiring must be compatible with the current flow of the system.

11. Water temperature gauge;
12. Electric bus only (manufactured after Aug 1, 2026):
 - a. Battery available range in miles;
 - b. Battery discharge and regeneration rate;
 - c. Battery temperature;
 - d. High-Voltage battery state of charge; and
 - e. Motor Temp.

B. All instruments shall be easily accessible for maintenance and repair.

C. The instruments and gauges shall be mounted on the instrument panel so that each is clearly visible to the driver while seated in a normal driving position.

D. Instruments and controls must be illuminated as required by [FMVSS 101, Controls and Displays](#).

School Bus Inspection Manual

Revised January 2026

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- E. Multi-Function Gauge (MFG)
 - 1. The driver must be able to manually select any displayable function of the gauge on an MFG, whenever desired.
 - 2. Whenever an out-of-limits condition that would be displayed on one or more functions of an MFG occurs, the MFG controller should automatically display this condition on the instrument cluster. This should be in the form of an illuminated telltale warning lamp, and the MFG should automatically display the out-of-limits indications. If two or more functions displayed on the MFG go out of limits simultaneously, the MFG should sequence automatically between those functions continuously until the conditions are corrected.
 - F. The use of an MFG does not relieve the need for audible warning devices, where required.
-

1.N. Insulation

❖ MSS. [169.4503](#)

Thermal insulation is required between roof panels and side panels of the bus body and shall meet the flammability requirements of FMVSS 302 with a minimum R-value of 5.5. Insulation shall be installed so as to prevent sagging.

1.O. Interior Cleanliness/Loose Objects

- A. The floor should be reasonably clean with no accumulation of dirt, dust and refuse. The interior shall also be free of graffiti.
 - B. Essential tools necessary for cleanliness and basic cosmetic upkeep (i.e., shovel, broom, windshield washer fluid, etc.) shall be secured.
 - C. When used, a trash container shall be secured by a holding device that is designed to prevent movement and to allow easy removal and replacement. It shall be installed in an accessible location in the driver's compartment, not obstructing passenger access to the entrance door.
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1.P. Metal Treatment

- A. All metal except high-grade stainless steel or aluminum used in construction of the bus body shall be zinc-coated, aluminum-coated or treated to prevent corrosion. This includes but is not limited to such items as structural members, inside and outside panels, door panels and floor sills. Excluded are such items as door handles, grab handles, interior decorative parts and other interior plated parts.
 - B. All metal parts that will be painted, in addition to the above requirements, shall be chemically cleaned, etched, zinc phosphate-coated, and zinc chromate- or epoxy-primed to improve paint adhesion. This includes, but is not limited to, such items as the crossing control arm and stop arm.
 - C. In providing for these requirements, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges on punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subjected to abrasion during vehicle operation.
 - D. As evidence that the above requirements have been met, samples of materials and sections used in the construction of the bus body shall be subjected to a cyclic corrosion testing as outlined in SAE J1563.
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School Bus Inspection Manual

Revised January 2026

1.Q. Mirrors

Visually inspect all mirrors to identify any mirror that is damaged, clouded, or otherwise has an obscured area. All mirrors should hold a set adjustment. All mirrors should be directed to view the intended area for which they are designed.

1.Q.1. Mirrors (Exterior)

❖ [MSS 169.4501](#)

❖ [FMVSS 111](#)

- A. Each school bus shall be equipped with exterior mirrors meeting the requirements of [FMVSS 111, Rearview Mirrors](#). The right-side rearview mirror shall not be obscured by the unwiped portion of the windshield. Mirrors shall be easily adjustable, but shall be rigidly braced so as to reduce vibration.
- B. [FMVSS 111](#) requires two systems of mirrors to be used on a school bus: System A and System B.
- C. System A - There shall be one on each side of the bus. Each mirror shall have a reflective surface of at least 323 square centimeters (50.065 square inches). They shall provide a view of the rear tires and extend to a point of no less than 200 feet to the rear of the bus from the mirror surface.
- D. System B – Each bus shall be equipped with a series of mirrors that will allow the driver to see cylinders A through P using the mirror adjustment grid.
- E. A mirror adjustment grid is provided (Fig. 5) to assist in a visual reference related to the viewing area for each mirror.

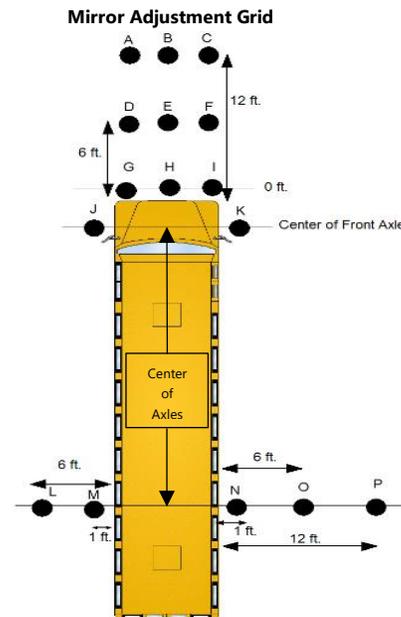


Figure 5

1.Q.2. Mirrors (Interior)

The interior glass mirror shall be either laminated or tempered and shall have rounded corners and protected edges. Mirrors shall be 6 by 16 inches minimum for Type A buses and 6 by 30 inches minimum for Types C and D buses.

1.R. Mobile Data Device (Optional)

- A. If equipped, the Mobile Data Device (MDD) shall be mounted in an area that shall not block the driver's field of view through the windshield. The MDD shall not block the view of/or access to any gauges, mirrors, indicator lights, or safety controls.
- B. The MDD shall be securely mounted as to not be a snagging hazard in the student-loading area of the service door.
- C. Audio and/or visual turn-by-turn instructions from the MDD system are allowed while the bus is being operated. Audible directions shall not use the speakers within the passenger compartment.
- D. While the bus is in motion, audio and visual instructions on the MDD may remain functional, but operational and tactile functions shall be disabled.

School Bus Inspection Manual

Revised January 2026

1.S. Passenger Advisory System (Optional)

If installed, a passenger advisory system shall require the driver to walk through the bus looking for all children before leaving the bus. The driver shall go to the rear of the bus to deactivate the system. If the driver tries to leave the bus without deactivating the system, the system shall cause the horn to sound, notifying others that the bus may still be occupied.

1.T. Rub Rails

- ❖ MSS [169.4501](#) and [169.4503](#)
- A. A minimum of three rub rails are required.
- B. There shall be one rub rail on each side of the bus located at, or no more than eight inches above, the seat cushion level. They shall extend from the rear side of the entrance door completely around the bus body (except at the emergency door or any maintenance access door) to the point of curvature near the outside cowl on the left side.
- C. There shall be one additional rub rail on each side located 10 inches or less above the floor line. The rub rail shall cover the same longitudinal span as the upper rub rail, except at the wheel housing, and it shall extend only to the longitudinal tangent of the right and left rear corners.
- D. Rub rails above the floor line shall be attached at each body post and at all other upright structural members.
- E. One rub rail shall be installed at the base of the skirt of the bus.
- F. Each rub rail shall be four inches or more in width in its finished form and shall be constructed of 16-gauge metal or other material of equivalent strength suitable to help protect body side panels from damage. Rub rails shall be constructed in corrugated or ribbed fashion.
- G. Rub rails shall be applied outside the body or outside the body posts. (Pressed-in or snap-on rub rails do not satisfy this requirement.) For Type A-1 vehicles using the body provided by the chassis manufacturer or for Types A-2, B, C, and D buses containing the rear luggage or the rear engine compartment, rub rails need not extend around the rear corners.
- H. Ascertain that the rub rails are installed as required.

1.U. Seating Design & Installation / Seat Belts

- ❖ MSS [169.4501](#) and [169.4503](#)
 - ❖ FMVSS [207](#), [208](#) and [222](#)
 - A. The driver's seat shall be of a high-back type that includes a head restraint.
 - B. All seats must be forward facing.
 - C. All school buses shall be equipped with restraining barriers that conform to FMVSS No. 222.
 - D. Each seat leg shall be secured to the floor by bolts, washers and nuts in order to meet the performance requirements of [FMVSS 222](#). Flange-head nuts may be used in lieu of nuts and washers. All seat frames attached to the seat rail shall be fastened with two or more bolts, washers and nuts, or with flange-head nuts. Seats may be track-mounted in accordance with [FMVSS 222](#). A padded crash barrier meeting federal manufacturing requirements for school bus seats and crash barriers must be installed for each seating position. All crash barriers must be installed according to and conform to [FMVSS 222](#).
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School Bus Inspection Manual

Revised January 2026

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- E. Seat cushions shall have a minimum depth of 15 inches. The seat backs shall have a minimum height of 20 inches for school buses manufactured prior to Jan. 1, 2013, and 24 inches for school buses manufactured on or after Jan. 1, 2013, from a seating reference point. Contact your seating manufacturer for additional information on the seating reference points.
 - F. All restraining barriers and passenger seats shall be covered with a material that has fire retardant or fire block characteristics.

1.U.1. Seat Belt(s)

- A. For buses manufactured before Jan. 1, 1995: A lap belt must be provided for the driver. The seat belt and its mounting must comply with [FMVSS 207 through 210](#). Each seat belt section must be booted to keep the buckle and latch off the floor and within easy reach of the driver. The seat belt must be anchored or guided at the seat frame to prevent the driver from sliding sideways under the seat belt.
- B. For buses manufactured after Dec. 31, 1994: A Type II lap belt/shoulder harness seat belt shall be provided for the driver. The assembly shall be equipped with an emergency locking retractor (ELR). The lap belt portion shall be guided or anchored where practical to prevent the driver from sliding sideways under it.
- C. Buses equipped with optional passenger seat belts must comply with applicable FMVSS [208-210](#), [213](#), [222](#), and [225](#).
- D. Lap belts shall not be installed on passenger seats in large school buses (over 10,000 pounds GVWR) built after Aug 1, 2026.

1.U.2. Seat Condition/Cushion(s)

Passenger seat cushions shall be fastened to prevent the cushions from disengaging from the seat frames.

1.U.3. Seat Spacing

❖ [FMVSS 222 S5.2](#)

- A. Seat spacing fails to comply with FMVSS 222.
- B. If track seating is installed, the manufacturer shall supply minimum and maximum seat spacing dimensions (applicable to the bus) which comply with FMVSS No. 222. This information shall be on a label permanently affixed to the bus.

1.U.4. Seat(s), Barrier(s) and Occupant Restraint Inspection Procedure

- A. Inspect the driver's seat for its ability to maintain the adjusted position.
 - B. Inspect all seats and barriers to ensure that all are securely mounted and not loose or broken and properly spaced.
 - C. Inspect seatbelt webbing for cuts, fraying, or extreme/unusual wear.
 - D. Seats and barriers should appear symmetrical. Seats/barriers that do not appear symmetrical should be physically inspected to ensure seat covering and/or padding is not significantly compromised and complies with FMVSS 571.222.
-

School Bus Inspection Manual

Revised January 2026

- E. Inspect buckle and latch for damage and proper operation by inserting the latch, listening for an audible click, tugging the latch against the buckle and attempting to withdraw it, then pushing buckle release button to eject latch.
- F. Inspect shoulder upper anchorage guide; webbing must move freely through anchorage guide.
- G. Inspect shoulder belt height adjuster (if equipped); it must slide freely and be free from damage. If equipped with mechanical adjustments, the adjuster must lock at each height position.
- H. Inspect retractor for proper operation; webbing must fully retract.
- I. Inspect buckle mounting and shoulder webbing anchorage hardware. Ensure that all items are properly installed and free from damage.
- J. Inspect for cuts, tears, or damage that compromises the fire block/retardant characteristic and is a defect. Every seat shall be in a state of good repair that prevents the sensation of any seat framing due to seat foam degradation.

1.V. Side Skirts

Buses manufactured on or after Jan. 1, 2008 shall have side skirts between the front and rear axles that extend down to within two inches plus or minus, of the horizontal line from the center of the front spindle to the center of the rear axle. The manufacturer may offer optional side skirt lengths that extend lower than this requirement. This measurement shall apply to a new unloaded school bus located on a flat, level surface.

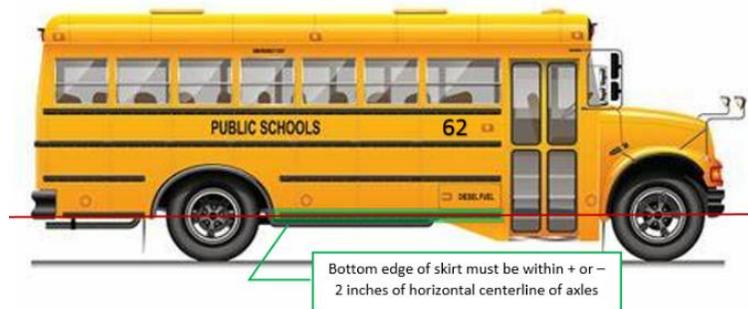


Figure 6

1.W. Steps

- A. The first step at the service door must be not less than 10 inches and not more than 16 inches from the ground, based on standard chassis specifications.
- B. Step risers shall not exceed a height of 10 inches. When a plywood floor is used on steel, the riser height may be increased by the thickness of plywood used. Steps must be enclosed to prevent accumulation of ice and snow.
- C. Steps must be enclosed and not protrude beyond the bodyline. Grooves in the covering must run perpendicular (90°) to the long dimension of the step. There must be a 1 ½ inch white nosing as an integral piece without joints.
- D. The step well or support structure should not be damaged.
- E. All steps, including the floor-line platform area, must be covered with elastomer floor covering at least 0.187 (³/₁₆) inches thick.
- F. A step covering shall be permanently bonded to a durable backing material resistant to corrosion.
- G. Steps including floor line platform shall have a 1 ½-inch white nosing as an integral piece.

School Bus Inspection Manual

Revised January 2026

1.W.1. Step/Stepwell Inspection Procedure

Visually inspect the stepwell for the condition of support structure to ensure structural stability. Inspect stepwell treads to ensure proper securing and adhesion to the stepwell. Visually inspect step treads for any excessive worn areas that may pose a tripping or slip hazard

1.W.2. Stirrup Steps

- A. There may be at least one folding stirrup step or recessed foothold and suitably located handles on each side of the front of the bus body. This is permissible for easy accessibility to clean the windshield and lamps, except when the windshield and lamps are easily accessible from the ground.
- B. Steps are permitted in or on the front bumper, in place of the stirrup steps, if the windshield and lamps are easily accessible for cleaning from that position.

1.X. Storage Compartment

A container of adequate strength and capacity for storage of tire chains and/or tow chains and such tools must be provided if such items are carried on the bus. The storage container may be located either inside or outside of the passenger compartment. If inside, it must be fastened to the floor and have a cover.

Interior Overhead Compartments must:

- A. Comply with head-protection requirements of FMVSS 222, School Bus Passenger Seating and Crash Protection, where applicable.
- B. Be completely enclosed and equipped with latching door (both door and latch sufficient to withstand a pushing force of 50 pounds applied at the inside center of the door).
- C. Have all corners and edges rounded with a minimum radius of 1 inch or be padded equivalent to door header padding.
- D. Be attached to the bus sufficiently to withstand a force equal to 20 times the maximum rated capacity of the compartment.
- E. Have no protrusions greater than ¼ inch.

1.Y. Sun Shield

- A. On Types B, C and D school buses, an interior adjustable transparent sun shield with a finished edge and dimensions not less than 6 by 30 inches, shall be installed in a position convenient for use by the driver.
- B. On Type A school bus, the sunshield (visor) shall be installed by the chassis manufacturer.

1.Z. Two-Way Communication

- ❖ [MSS 169.4503, subdivision 6](#) and [169.4504](#)

All buses manufactured after January 1, 1995, shall have a two-way voice communications system.

1.AA. Undercoating

The entire underside of the bus body, including floor sections, crossmembers and below floor-line side panels, shall be coated with rustproofing materials. The undercoating material shall not cover any exhaust components or any high-voltage components or cables of a battery-electric or hybrid-electric chassis.

School Bus Inspection Manual

Revised January 2026

1.BB. Ventilation, Heating and Cooling Systems

❖ MSS [169.4501](#) and [169.4503](#)

❖ FMVSS [103](#) and [217](#)

- A. A minimum of 2 auxiliary fans shall be placed in locations where they can be adjusted for maximum effectiveness and where they do not obstruct the driver's vision to the mirrors or interfere with the safe operation of the vehicle. Type A school buses may be equipped with one auxiliary fan. Auxiliary fans shall meet the following requirements:
 - 1. Fans shall be 6 inches (nominal) in diameter.
 - 2. Fan blades shall be enclosed in a protective cage.
 - 3. Each fan shall be controlled by a separate switch.
- B. The bus body shall be equipped with a suitably controlled ventilating system with capacity sufficient to maintain the proper quantity of airflow under operating conditions without having to open a window except in extremely warm weather.
- C. Static-type, non-closeable exhaust ventilation shall be installed in a low-pressure area of the roof.
- D. Roof hatches designed to provide ventilation in all types of exterior weather conditions may be provided.

1.BB.1. Heating System

- A. The heater shall be hot water combustion type, electric heating element, or heat pump.
 - B. If only one heater is used, it shall be fresh-air or combination fresh-air and recirculation type.
 - C. If more than one heater is used, additional heaters may be recirculating air 54 type.
 - D. The heating system shall be capable of maintaining bus interior temperatures, as specified in test procedure SAE J2233.
 - E. Auxiliary fuel-fired heating systems are permitted, provided they comply with the following:
 - 1. Except for electric-power school buses, the auxiliary heating system shall utilize the same type of fuel as specified for the vehicle engine.
 - 2. The heater(s) may be direct, hot air-type or may be connected to the engine coolant system.
 - 3. An auxiliary heating system, when connected to the engine coolant system, may be used to preheat the engine coolant or preheat and add supplementary heat to the heating system.
 - 4. Auxiliary heating systems shall be installed pursuant to the manufacturer's recommendations and shall not direct exhaust in such a manner that will endanger bus passengers.
 - 5. All combustion heaters shall be in compliance with current Federal Motor Carrier Safety Regulations.
 - 6. The auxiliary heating system shall require low voltage.
 - 7. Auxiliary heating systems shall comply with FMVSS No. 301, Fuel System Integrity, and all other applicable FMVSS, as well as with SAE test procedures.
 - F. All forced-air heaters installed by body manufacturers shall bear a name plate that indicates the heater rating in accordance with SBMTC-001, Standard Code for Testing and Rating Automotive
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School Bus Inspection Manual

Revised January 2026

Bus Hot Water Heating and Ventilating Equipment. The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate.

- G. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or any sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hoses shall conform to SAE J20c, Coolant System Hoses. Heater lines, cores, and elements on the interior of the bus shall be shielded to prevent scalding or burning of the driver or passengers.
- H. Each hot water system installed by a body manufacturer shall include one shutoff valve in the pressure line and one shutoff valve in the return line, with both valves at the engine in an accessible location, except that on Types A and B buses, the valves may be installed in another accessible location.
- I. All heaters of hot water type in the passenger compartment shall be equipped with a device, installed in the hot water pressure line, which regulates the water flow to all passenger heaters. The device shall be conveniently operated by the driver while seated. The driver and passenger heaters may operate independently of each other for maximum comfort.
- J. On hot water type systems, accessible bleeder valves for removing air from the heater shall be installed in an appropriate place in the return lines of any body company-installed heater.
- K. Access panels shall be provided to make heater motors, cores, elements and fans readily accessible for service. An exterior access panel to the driver's heater may be provided.
- L. Portable heaters shall not be used.

1.BB.2. Passenger Compartment Air Conditioning (Optional)

The following specifications are applicable to all types of school buses that may be equipped with air conditioning.

- A. Evaporator cases, lines, and ducting (as equipped) shall be designed in such a manner that all condensation is effectively drained to the exterior of the bus below the floor level under all conditions of vehicle movement and without leakage on any interior portion of the bus.
 - B. Evaporators and ducting systems shall be designed and installed to be free of projections or sharp edges. Ductwork shall be installed so that exposed edges face the front of the bus and do not present sharp edges.
 - C. On school buses equipped with Type-2 seatbelts having anchorages above the windows, the ducting (if used) shall be placed at a height sufficient to not obstruct occupant securement anchorages. This clearance shall be provided along the entire length (except at evaporator locations) of the passenger area on both sides of the bus interior.
 - D. Air intake for any evaporator assembly(ies), except for front evaporator of Type A-1, shall be equipped with replaceable air filter(s) accessible without disassembly of evaporator case.
 - E. For all buses (except Type D rear engine transit) equipped with a rear evaporator assembly, evaporator shall not encroach upon head impact zone, but may occupy an area of less than 26.5 inches from the rear wall and 14 inches from the ceiling.
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School Bus Inspection Manual

Revised January 2026

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- F. For Type D rear engine transit buses equipped with a rear evaporator over the davenport, the evaporator assembly may not interfere with the rear exit window and may not extend above the rear seating row.
-

1.BB.3. Ventilation, Heating and Cooling Inspection Procedure

- A. Check each heater/air conditioner for proper mounting and operation.
 - B. Ensure that all access panels and protective coverings are in place (heater lines, cores and elements on the interior of the bus shall be shielded to prevent scalding or burning of the driver or passengers).
 - C. Check hoses/wiring for wear and proper connection.
 - D. Inspect heating and cooling systems for any fluid leaking into the interior of the bus.
 - E. Any installed defroster, heater, or auxiliary fan(s) are required to work on either high or low. There is no requirement for both fan speeds to be operational.
-

1.CC. Wheel Housing

- A. The wheel housing opening shall allow for easy tire removal and service.
 - B. Wheel housings shall be attached to the floor panels in a manner that prevents any dust, water or fumes from entering the body, and shall be constructed of 16-gauge (or thicker) steel.
 - C. The inside height of the wheel housings above the floor line shall not exceed 12 inches.
 - D. Wheel housings shall provide clearance for installation and use of tire chains on single or dual (if so equipped) power-driving wheels.
 - E. No part of a raised wheel housing shall extend into the emergency door opening.
-

1.DD. Windows and Window Glass (Standard)

- ❖ MSS [169.4501](#), [169.4503](#), [169.71](#) and [169.74](#)
 - ❖ FMVSS [205](#), [217](#) and [220](#)
 - A. The entrance door glass and the window to the left of driver shall be composed of clear glass. Approved tinted glass is permitted on all other windows as approved by [MSS 169.71](#).
Note: Type III vehicles must comply with MSS [169.71](#).
 - B. Windshields, entrance and rear emergency exit doors must be composed of approved safety glass. All glass shall be federally approved and marked as provided in MSS 169.74.
 - C. The window to the left of the driver and the upper service door windows must be thermal glass. Regardless of a bus's date of manufacture, the window immediately behind the entrance door does not need to be made of thermal glass. The window to the left of the driver for Type A buses need not be thermal glass.
 - D. Each full side window must provide an unobstructed emergency opening at least 9 inches high (but not more than 13 inches high) and 22 inches wide. Obtain the measurements by lowering the window.
 - E. Laminated or tempered glass (AS2 or AS3) is permitted in all other windows as specified in ANSI Z26.1. All glass shall be federally approved and marked as provided in section MSS 169.74.
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School Bus Inspection Manual

Revised January 2026

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- F. The glass interior must not be cracked, allowing passengers to feel it with their hand(s). Intersecting cracks are not allowed if the window is a thermal pane, and a passenger/driver must be able to view through it.
-

1.DD.1. Windshield

- A. Only approved safety glass may be used. The glass shall be mounted to display the permanent glass markings, and it shall be of sufficient quality to prevent [visibility] distortion in all directions. Windshield markings must be AS1.
- B. The windshield must not have discoloration or other damage in that portion extending upward from the height of the topmost portion of the steering wheel, but not including a 2-inch border at the top of and a 1-inch border at each side of the windshield or each panel thereof, except as follows:
1. Color or tint applied by the manufacturer for the reduction of glare.
 2. Any crack not over $\frac{3}{4}$ inch long, if not intersected by any other crack.
 3. Any damaged area that can be covered by a disc $\frac{3}{4}$ inch in diameter if not closer than 3 inches to any other such damaged area.
- C. A driver's side area window(s) having chips, clouding, or cracks that obscure the driver's vision.
- D. The windshield may be of uniform tint throughout or may have a horizontal gradient band starting slightly above the line of vision and gradually decreasing in light transmission to 20 percent or less at the top of the windshield.
- E. If a windshield is replaced, a new certificate will be provided.
-

1.DD.2. Windshield Wipers

- ❖ [MSS 169.4501](#)
 - ❖ [FMVSS 104 S.4](#)
- A. A two-speed or variable speed windshield wiping system, with an intermittent feature, shall be provided and shall be operated by a single switch.
- B. The wipers shall meet the requirements of [FMVSS 104, Windshield Wiping and Washing Systems](#).
1. One frequency or speed shall be at least 45 cycles per minute regardless of engine load and engine speed, and the lower frequency or speed shall be at least 20 cycles per minute regardless of engine load and engine speed.
- C. A wiper blade shall not be bent, torn, broken, or have other defects that impair the wiper's ability to effectively clear the windshield of rain, snow or other forms of moisture.
-

1.DD.3. Windshield Washer System

A windshield washer system shall be provided, and it must be kept in good working condition. An empty washer fluid reservoir shall be deemed inoperative.

School Bus Inspection Manual

Revised January 2026

1.DD.4. Windshield/Wipers/Washers Inspection Procedure

- A. Visually inspect for any glass or glazing that is broken through or missing (393.60).
 - B. B. Visually inspect for any glass not of approved type [393.60(a)].
 - C. Visually inspect windshield to ensure there is no discoloration or other damage in that portion extending upward from the height of the topmost portion of the steering wheel, but not including a two-inch border at the top and a one-inch border at each side of the windshield or each panel thereof, except as follows:
 - 1. Color or tint applied by the manufacturer for the reduction of glare;
 - 2. Any damaged area, that can be covered by a disc $\frac{3}{4}$ inch in diameter, if not closer than three inches to any other such damaged area.
 - D. Inspect windshield for cracks over $\frac{3}{4}$ inch in length.
 - E. Inspect the windows to the immediate left and right of the driver for any damage, obscurities, fogging, or other obstruction.
 - F. Inspect the defrosting and defogging system to ensure that the driver's windshield is able to be properly cleared (571.103).
 - G. Operate the wiper system. The wiping system should be power-driven with at least two speeds and should be able to clean the area of the windshield within the wiping pattern. Wipers should operate with a minimum of 45 cycles per minute.
 - H. Operate the washer system. The washer system should direct fluid onto the windshield to assist in removing debris.
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School Bus Inspection Manual

Revised January 2026

2. Brakes

Item/Method of Inspection

2.A. Brakes: General

- ❖ MSS 169.4502 [and 169.67](#)
- A. The chassis brake system shall conform to the provisions of FMVSS [105, Hydraulic and Electric Brake Systems](#); [106, Brake Hoses](#); and [121, Air Brake Systems](#) as applicable. All buses shall have either a parking pawl in the transmission or a park brake interlock that requires the driver to apply the service brake to allow release of the parking brake.
- B. The anti-lock brake system (ABS), provided in accordance with FMVSS [105, Hydraulic and Electric Brake Systems](#) or [121, Air Brake Systems](#), shall provide wheel speed sensors for each front wheel and for each wheel on at least one rear axle. The system shall provide anti-lock braking performance for each wheel equipped with sensors (four channel system). The ABS malfunction indicator light must function as designed on all ABS required vehicles.
- C. All Type A, C, and D buses manufactured after August 1, 2026, shall include Electronic Stability Control.
- D. All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis component(s).
- E. The brake lines, booster-assist lines and control cables shall be protected from excessive heat, vibration and corrosion and installed in a manner that prevents chafing.
- F. The parking brake system for either air or hydraulic service brake systems may be of a power-assisted design. The power parking brake actuator should be a device located on the instrument panel within reach of a seated fifth-percentile female driver. As an option, the parking brake may be set by placing the automatic transmission shift control mechanism in the "park" position.
- G. The power-operated parking brake system may be interlocked to the engine key switch. Once the parking brake has been set and the ignition switch turned to the "off" position, the parking brake cannot be released until the key switch is turned back to the "on" position.
- H. Brake systems shall have no loose, broken, or missing components.

2.A.1. Brake Shoe/Pad/Lining

The brake lining must be adequate in thickness, means of attachment and physical characteristics to provide for safe and reliable stopping of the vehicle.

- A. Visually inspect all brake linings/shoes/pads. Linings may be checked through inspection slots. All shoes/pads/linings shall comply with the applicable standards. Brake linings with uneven wear can indicate a worn or seized brake component (i.e., pistons, slide pins, etc.).
- B. The brake lining/pad thickness shall not be less than $\frac{3}{16}$ inch at the shoe center for a shoe with a continuous strip of lining, less than $\frac{1}{4}$ inch at the shoe center for a shoe with two pads, or worn to the wear indicator if the lining is so marked for air drum brakes.
- C. The brake lining/pad thickness shall not be less than $\frac{1}{8}$ inch for air disc brakes, or $\frac{1}{16}$ inch or less for hydraulic disc brakes.

School Bus Inspection Manual

Revised January 2026

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- D. Visually inspect the brake lining/pad to ensure that it is firmly attached to the shoe, is not cracked or broken, and that the friction surface is not saturated with oil, grease, or brake fluid.
 - E. Visually inspect all brake component mounting hardware for any loose, cracked, broken or missing items. This inspection should be performed both with the brakes released and with the brakes applied. It may be necessary to remove inspection access covers or brake dust covers or, in some instances, pull wheels and drums to accomplish the inspection.

2.A.2. Drums/Rotors

A school bus shall not have brake drums or rotors worn or ground past the minimum safe thickness recommended by the manufacturer. Brake drums and rotors shall not be cracked, broken, missing, or have loose or elongated mounting holes, or be contaminated with grease or oil.

- A. Visually inspect all brake drums/rotors for any external cracks that open when brakes are applied. (Do not confuse short hairline internal check cracks with flexural cracks.)
- B. Inspect for any portion of the drum/rotor missing or in danger of falling away.

Note: It may be necessary to remove inspection access covers, brake dust covers or, in some instances, pull wheels and drums to accomplish the inspection.

2.B. Brakes: Air (Design Standard)

- ❖ [MSS 169.4501](#) and [169.4502 subdivision 2](#)
- ❖ [FMVSS 121](#)
- A. The air pressure supply system shall include a desiccant-type air dryer installed according to the manufacturer's recommendations. The air pressure storage tank system may incorporate an automatic drain valve.
- B. The chassis manufacturer shall provide an accessory outlet for air-operated systems installed by the body manufacturer. This outlet shall include a pressure protection valve to prevent loss of air pressure in the service brake reservoir.
- C. For air brake systems, an air pressure gauge shall be provided in the instrument panel capable of complying with commercial driver's license (CDL) pre-trip inspection requirements.
- D. Air brake systems shall include a system for anti-compounding of the service brakes and parking brakes.
- E. Air brakes shall have both a visible and audible warning device whenever the air pressure falls below the level where warnings are required under [FMVSS 121, Air Brake Systems](#).

2.B.1. Air Brake Components

- A. A school bus shall not have any air brake parts such as air lines, air reservoirs (tanks), valves, fittings, air brake chambers, governors or slack adjusters that are leaking, cracked, missing, inoperative, out of adjustment, loose, worn, broken, improperly secured or retained, inadequate, or any other condition or defect likely to reduce the efficiency of the brake system.
 - B. Each school bus (if applicable) must have an air compressor of sufficient capacity to increase air pressure in the supply and service reservoirs from 85 pounds per square inch (psi) to 100 psi within a reasonable amount of time, i.e. 3 to 4 minutes, for maximum (actual reservoir capacity x25) required reservoir capacity.
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School Bus Inspection Manual

Revised January 2026

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- C. Each school bus with a compressed air service brake system shall have an illuminated pressure gauge for each service brake reservoir system, readily visible to a person in the normal driving position that indicates the service reservoir system air pressure. The accuracy of the gauge shall be within +/- 7 percent of the compressor cutout pressure – [FMVSS 121](#).
-

2.B.1.1.

Air Brake Reservoir

- ❖ [MSS 169.4502](#)
 - ❖ [FMVSS 101 through 121](#)
- A. Each service brake system shall be protected against loss of pressure due to failure or leakage in the system between the service reservoir and the source of the pressure, by check valves or equivalent devices whose proper functioning can be checked without disconnecting any airline or fitting.
- B. Each reservoir shall have a condensation drain valve that can be operated manually.
- C. Each school bus with compressed air service brakes shall have at least two reservoirs or one vessel divided into two compartments connected in a series.
- D. Lines supplying air to the air system reservoirs shall be safeguarded through proper design and bracing to protect from excessive heat or vibration.
- E. The first reservoir of every air brake system shall have mounted on it a safety valve to protect against excessive air brake system pressure.
-

2.B.1.2.

Air Brake Hoses and Tubing

- ❖ [MSS 169.4501](#)
 - ❖ [FMVSS 106](#)
- A. Hoses, lines and tubing shall not leak, nor have any bulging or swelling when the system is pressurized. A hose, line or tubing shall not be cracked, broken or crimped in such a manner as to restrict flow; any hose abraded (chafed) through the outer cover to the fabric layer or any line/tubing; and for proper securement and support.
- B. Carefully perform a visual inspection of all system hoses, lines and tubing.
- C. Inspect all hoses, lines, and tubing for any audible leak, any bulging/swelling when the system is pressurized, any hose, line, or tubing that is cracked, broken or crimped in such a manner as to restrict flow, any hose abraded (chafed) through outer cover to fabric layer or any line/tubing, and for proper securement and support.
-

2.B.1.3.

Air Brake Inspection Procedure

Air System

With full system air pressure, depress the brake pedal and inspect each wheel-end brake to determine if effective braking forces are applied to each wheel-end brake. There should be no audible air loss at supply lines, fittings, valves or brake chambers.

With full system pressure, make a single full-service brake application with the parking brake and ignition off. Note the gauges and listen for air leaks. Release the service brake.

If an air leak is detected at any point in the inspection process, the inspector should check the vehicle's air loss rate following these procedures:

1. Set engine at idle and release brakes.
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School Bus Inspection Manual

Revised January 2026

2. Reduce air pressure in reservoir to 80 psi.
3. Make a full brake application with governor cut-in.
4. Check air pressure gauge after initial application for air loss. Air pressure should be maintained or increase. A drop in pressure indicates a serious air leak in the brake system.

Low Air Warning

Drain the air tanks by making a series of brake applications. As you deplete the air supply in the tanks, watch the emergency brake button and the air gauge. The spring brakes must apply before the air supply is depleted. The spring brakes should set between 20 and 45 psi.

Start the engine to build air pressure in the air tanks. The audible and/or visual warning device should turn off at 60 psi or half the governor cutout pressure. Additionally, check the air buildup time – refer to [FMVSS 121 subpart 5.1.1](#)

Air Brake Measurements

The following procedure is based on the applied stroke method for measuring the movement of the brake chamber push rod:

1. Release the spring brakes and visually check each brake to ensure that it is in the normal released position.
2. With the brakes released, make a mark where the pushrod exits the brake chamber.
3. With the engine off, make a series of brake applications to reduce the reservoir pressure to between 90 and 100 psi.
4. Apply and hold a full brake application (90 to 100 psi).
5. Measure the distance between the mark and the face of the brake chamber. The difference between measurements is called the chamber-applied stroke.

Note: Any brake that is beyond the re-adjustment limit will require repairs and/or adjustment. (See Table 3 and 4: Brake Adjustment Specifications below.)

Clamp Type Chamber Data			
Type	Rated Stroke Marking	Outside Diameter	Brake Adjustment Limit
6	A	4 1/2	1 1/4
9	B	5 1/4	1 3/8
12	B	5 11/16	1 3/8
16	D	6 3/8	1 3/4
20	D	6 25/32	1 3/4
24	D	7 7/32	1 3/4
30	E	8 3/32	2
36		9	2 1/4

Table 3

School Bus Inspection Manual

Revised January 2026

"Long Stroke" Clamp Type Brake Chamber Data			
Type	Rated Stroke Marking	Outside Diameter	Brake Adjustment Limit
12	D	5 ¹¹ / ₁₆	1 ³ / ₄
16	E	6 ³ / ₈	2
20 (2 ½" rated stroke)	E	6 ²⁵ / ₃₂	2
20 (3" rated stroke)	F	6 ²⁵ / ₃₂	2 ½
24 (2 ½" rated stroke)	E	7 ⁷ / ₃₂	2
24 (3" rated stroke)	F	7 ⁷ / ₃₂	2 ½
30	F	8 ³ / ₃₂	2 ½

Table 4

Chamber Size

Visually inspect all brake chambers to ensure they are properly marked, in good operating condition, have no visible damage, and are properly matched. Chambers must be matched by size, type, and stroke.

Slack Adjuster Length

Measure from the center of the S-cam to the center of the push rod clevis pin. All slack adjusters on a single axle shall be of the same type and length.

2.C. Brakes: Hydraulic

Buses using hydraulic-assist brakes shall meet requirements of [FMVSS 105](#).

2.C.1. Hydraulic Brake Hoses and Tubing

- A. A school bus shall have no hydraulic hoses, tubing, valves or connections that are cracked, chafed, or improperly retained or supported to prevent damage by heat, vibration or abrasion by contact with the frame axle, other lines or any other part of the vehicle. Brake hoses and tubing must conform to [FMVSS 106](#).
- B. A school bus shall have no hydraulic hoses, tubing, valves or connections that are leaking, restricted, pinched, broken, missing, or flattened.
- C. Carefully perform a visual inspection of all system hoses, lines and tubing.
- D. Inspect all hoses, lines, and tubing for any audible leak, any bulging/swelling when the system is pressurized, any hose, line, or tubing that is cracked, broken or crimped in such a manner as to restrict flow, any hose abraded (chafed) through outer cover to fabric layer or any line/tubing, and for proper securement and support.

2.C.2. Master Cylinder

- A. A master cylinder shall have a reservoir compartment for each service brake subsystem serviced by the master cylinder. Loss of fluid from one compartment shall not result in a complete loss of fluid from another compartment.
 - * See [FMVSS 105 subpart 5.4](#) for further information.

School Bus Inspection Manual

Revised January 2026

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- B. The master cylinder, wheel cylinder, caliper, assistor pump, assistor pump gear, belts or pulleys shall be free of cracks, leaks, wear, or damage, and they shall be securely mounted and properly adjusted.
 - C. A master cylinder and assistor reservoir shall be full of fluid above the safe level recommended by the manufacturer for all compartments of the fluid reservoir.
-

2.C.3. Power Assist

The power assist must operate as designed.

2.C.4. Warning Device

A school bus with a hydraulic service brake system or a hydraulic-assistor type over hydraulic service brake system must be equipped with a signal that provides a warning to the driver when a failure in the brake system occurs. The warning device shall be mounted in front of, and in clear view of, the driver and shall conform to [FMVSS 105 subpart 5.3](#) and [FMVSS 101](#).

2.C.5. Hydraulic System Inspection Procedure

Hydraulic Brake System

- A. With the engine off, turn the ignition switch to the "on" position and check the instrument panel for visible and audible warning signals to indicate system malfunction. If bus is equipped with vacuum assist, it shall have a visible warning signal and gauge to indicate any loss of vacuum. Audible signals must be loud enough to be heard over engine noise.
- B. Visually inspect the master cylinder to determine if it is below the minimum fill requirements, leaking, loose or improperly mounted.
- C. Visually inspect the hydraulic fluid reservoir level in the master cylinder unit. Inspect for any fluid leaks on wheel cylinders/calipers, master cylinders, hose connections and vacuum booster on buses using vacuum-assisted brakes. Check for brake fluid around the brake booster between the booster and firewall.

Pedal Reserve

- A. With the brake pedal in the full upright position, measure the distance between the brake pedal and the floor or firewall. With the engine running, make a single firm brake application and measure the distance between the brake pedal and the floor or firewall a second time. Record the difference.
- B. With vehicle stopped and engine running, depress the brake pedal. The system must be able to maintain brake pedal height under moderate foot force (40-60 pounds) for one minute without pumping. With the vehicle in the stopped position and the brake pedal depressed under moderate foot force (40-60 pounds), there should be a minimum of $\frac{1}{3}$ of the total available pedal travel (manufacturer's specification) remaining on non-powered systems.

Power Assist

- A. Electric/hydraulic assist: With engine off, depress the brake pedal. The electric/hydraulic brake assist motor must operate.
 - B. Vacuum assist: With engine off, pump the brakes to exhaust all reserve. Hold firm pressure on the brake pedal and start the engine. The pedal should fall slightly. Failure of the pedal to fall slightly indicates a malfunction of the power assist unit.
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School Bus Inspection Manual

Revised January 2026

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- C. Hydro-boost: After two or three brake applications with the engine off, start the vehicle while maintaining pressure on the brake pedal. The pedal should push briefly, and then fall as the power assist engages.

2.D. Parking/Emergency Brake System

- ❖ MSS [169.67 subdivision 1](#), [169.4501](#) and [169.4502 subdivision 2](#)
- ❖ FMVSS [105](#) and [121](#)

- A. Every motor vehicle, other than a motorcycle, when operated upon a highway, shall be equipped with brakes adequate to control the movement of and to stop and hold such vehicle, including two separate means of applying the brakes, each of which means shall be effective to apply the brakes to at least two wheels. If these two separate means of applying the brakes are connected in any way, they shall be so constructed that failure of any one part of the operating mechanism shall not leave the motor vehicle without brakes on at least two wheels – [169.67, subdivision 1](#).

The braking system must meet federal motor vehicle safety standards in effect at the time of manufacture – [169.4502, subdivision 2](#).

The parking brake system on a school bus with a GVWR of 10,000 lbs. or less, shall be capable of holding the vehicle stationary (to the limit of traction on the braked wheels) for 5 minutes in both forward and reverse directions on a 30-percent grade free from snow, ice and loose material.

The parking brake system on a school bus with a GVWR of 10,000 lbs. or more, shall be capable of holding the vehicle stationary for 5 minutes, in both forward and reverse positions, on a 20-percent grade free from snow, ice and loose material.

- B. A control by which the driver applies the emergency brake system must be located so the driver can readily operate it while properly restrained by a seat-belt assembly provided for the driver's use.

The parking brake on a school bus equipped with hydraulic brakes shall be equipped with a warning light readily visible to the driver in a normal driving position, and be marked in accordance with [FMVSS 101](#).

Note: An air brake equipped school bus is not required to have a parking brake warning light.

- C. A school bus must have either emergency features in the service brake system or a system separate from the service brake system.

2.D.1. Parking Brake Inspection Procedure

- A. With the engine operating and the parking brakes set, place the transmission in both forward and reverse gears. Attempt to gently move forward and rearward to determine if brakes will hold vehicle stationary;
- B. Visually and physically check condition of parking brake system and parking brake warning light.
-

School Bus Inspection Manual

Revised January 2026

3. Chassis

Item/Method of Inspection

3.A. Body Mounting

- A. The rear body crossmember shall be supported by the chassis frame. Except where chassis components interfere, the bus body shall be attached to the chassis frame at each main floor sill in such a manner as to prevent shifting or separation of the body from the chassis under severe operating conditions.
- B. Isolators shall be installed at all contact points between the body and the chassis frame on Types A-2, B, C and D buses, and shall be secured by a positive means to the chassis frame or body to prevent shifting, separation, or displacement of the isolators under severe operating conditions.
- C. Check that all body mounting/fastening devices, to include the isolators, are properly attached.
- D. Visually and physically inspect body hold-down components for damage that would permit the shifting of the body.

3.B. Bumpers

Front and rear bumpers are required.

Visually inspect front and rear bumpers for missing attaching hardware or broken hardware. Ensure bumpers are properly mounted and secure and there is no point protruding beyond the confines of the vehicle so as to create a hazard.

3.B.1. Bumper: Front

- A. School buses shall be equipped with a front bumper.
- B. The front bumper on buses of Type A-2 (with GVWR greater than 14,500 pounds), Type B, Type C, and Type D shall be equivalent in strength and durability to pressed steel channel at least 3/16 inches thick and not less than eight inches wide (high). It shall extend beyond the forwardmost part of the body, grille, hood, and fenders and shall extend to the outer edges of the fenders at the bumper's top line. Type A buses having a GVWR of 14,500 pounds or less may be equipped with an OEM-supplied front bumper. The front bumper shall be of sufficient strength to permit being pushed by another vehicle on a smooth surface with a five-degree, (8.7 percent) grade, without permanent distortion. The contact point on the front bumper is intended to be between the frame rails, with as wide a contact area as possible. If the front bumper is used for lifting, the contact points shall be under the bumper attachments to the frame rail brackets unless the manufacturer specifies different lifting points in the owner's manual. Contact and lifting pressures should be applied simultaneously at both lifting points.
- C. The front bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight, per Section B, without permanent distortion to the bumper, chassis, or body.
- D. The bumper shall be designed or reinforced so that it will not deform when the bus is lifted by a chain that is passed under the bumper (or through the bumper if holes are provided for this purpose) and attached to both tow hooks/eyes. For the purpose of meeting this specification, the bus shall be empty and positioned on a level, hard surface, and both tow hooks/eyes shall share the load equally.

School Bus Inspection Manual

Revised January 2026

3.B.2. Bumper: Rear

- A. The bumper on Type A-1 buses shall be a minimum of eight inches wide (high). Bumpers on Types A-2, B, C, and D buses shall be a minimum of 9½ inches wide (high). The bumper shall be of sufficient strength to permit being pushed by another vehicle of similar size and being lifted by the bumper without permanent distortion.
- B. The bumper shall wrap around the back corners of the bus. It shall extend forward at least 12 inches, measured from the rearmost point of the body at the floor line, and shall be mounted flush with the sides of the body or protected with an end panel.
- C. The bumper shall be attached to the chassis frame in such a manner that it may be removed. It shall be braced to resist deformation of the bumper resulting from impact from the rear or the side. It shall be designed to discourage hitching of rides by an individual.
- D. The bumper shall extend at least one inch beyond the rearmost part of the body surface, measured at the floor line.
- E. The bottom of the rear bumper shall not be more than 30 inches above ground level.

3.C. Differential

The differential housing shall not be cracked or leaking.

3.D. Driveshaft

- A. Universal joints must not be worn or faulty, or have any obvious welded repairs.
- B. The center (carrier) bearing and bracket shall not be cracked, loose, worn, causing movement of more than ½ inch.
- C. The driveshaft shall be protected by a metal guard or guards around its circumference to reduce the possibility of its whipping through the floor or dropping to the ground, if broken. There should be a guard for each section of the drive shaft.

3.D.1. Driveshaft Inspection Procedure

- A. Visually and physically inspect each segment of the driveshaft and associated hardware. Inspect for bends, cracks, missing weights or debris entangled in the shaft. Each shaft more than 18 inches long shall be equipped with a suitable guard to prevent an accident or injury in the event of its fracture or disconnection. The inspector shall check to ensure that the driveshaft guards are not loose, bent or missing.
- B. Visually and physically inspect each universal joint and center bearing. The universal joint(s) and center bearing(s) shall not be loose or worn and shall have all attaching hardware securely fastened. The inspector shall check for lateral and vertical movement of the universal joints and center bearing by grasping the universal joint and attempting to move the joint laterally and vertically. Inspector shall inspect universal joints for substandard or welded repairs.
- C. Visually inspect driveshaft for proper phasing (See Figure 7).

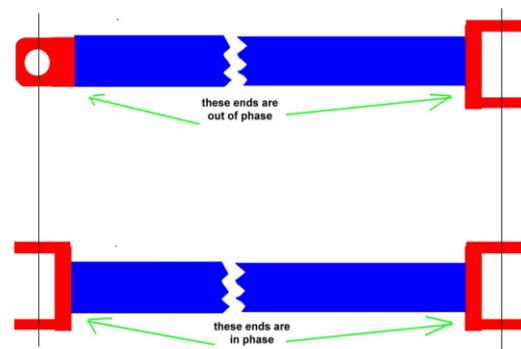


Figure 7

School Bus Inspection Manual

Revised January 2026

3.E. Electrical System

3.E.1. High-Voltage System

Batteries: High-Voltage

- A. High-voltage battery assemblies shall be protected according to federal requirements.
- B. High-voltage batteries shall have a main-service disconnect that isolates the batteries and does not allow high voltage outside the battery park.
- C. Buses with a high-voltage battery electric powertrain shall be equipped with a low-voltage battery shut-off switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

Electric Vehicle High-Voltage System

- A. The propulsion power source (batteries, fuel cell, etc.) shall be located outside the passenger compartment.
- B. The propulsion power source enclosure shall be constructed to conform to the power source manufacturer's requirements and recommendations.
- C. Wire, cable, and conductor insulation in the High Voltage System shall provide adequate insulation for the voltage used and for ambient temperatures ranging from - 15°F to 120°F. All high-voltage wiring/cabling shall be covered with bright orange loom or otherwise labeled as HIGH VOLTAGE.
- D. All high voltage circuits shall provide adequate and automatic protection against electrical overloads caused by short circuits or other excessive current conditions through the use of fuses, circuit breakers, and ground fault interruption.
- E. Each door, cover, or other panel that affords immediate access to any high voltage area shall be plainly marked with a hazard warning label which shall read WARNING—HIGH VOLTAGE or DANGER—HIGH VOLTAGE. This label shall be located in a highly conspicuous place.
- F. All high voltage areas shall be secured to deter unauthorized access.

3.E.1.1. Electric Vehicle Charging Port

- A. The high-voltage batteries shall be equipped with a system that allows the batteries to be charged via a connection to the local electrical utility grid. This connection shall be a Combined Charging System (CCS), North American Charging Standard (NACS), or SAE J1772, compatible with the charging equipment.
- B. The charging receptacle/port shall be mounted/located in accordance with the manufacturer standards. The receptacle shall accommodate the minimum requirements for Level II AC charging and DC fast charging.

3.E.1.2. Electric Vehicle DC-DC Converter

- A. DC-DC converter shall be provided and deliver a minimum of 200 amps at 12VDC.
 - B. The converter system shall incorporate a Ground Fault Interrupt (GFI) that disconnects/isolates the high-voltage batteries in the event of a shorted circuit or water intrusion.
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School Bus Inspection Manual

Revised January 2026

3.E.1.3. Electric Vehicle Ignition System

- A. The ignition switch circuit shall be linked to the Battery Management System and shall prevent the driving of the vehicle while it is connected to an external battery charging source.
- B. The high voltage system shall be designed so that when the ignition switch is off, the high voltage is disconnected

3.E.1.4. Electric Vehicle Regenerative Brakes

In addition to service brake specifications for combustion engine buses, Electric Vehicles (EVs) shall be equipped with regenerative braking that utilizes the electric drive system in concert with the service brakes to slow the vehicle and return electrical energy to the battery system.

3.E.1.5. Electric Vehicle System Protection

- A. As part of the Battery Management System, EVs shall be equipped with an automatic shutdown to protect system components from damage caused by malfunctions such as charging/discharging faults, battery overheating, electrical overheating, degraded battery health, etc.
- B. Prior to automatic shutdown, a warning or maintenance indicator shall display in the driver console to notify the driver of impending shutdown or the need for immediate maintenance and allow enough time to safely reposition and stop the bus. Gradual derating of propulsion shall occur prior to complete automatic shutdown.

3.E.2. Low Voltage System

- ❖ [MSS 169.4501 through 169.4503](#) (statute historical file)
- A. The storage battery, as established by the manufacturer's rating, must be of sufficient capacity for starting and operating lighting, signal devices, heating and other electrical equipment. Attempt to verify the battery size in addition to any options.
- B. A master switch may be installed on any Type A, B, C, or D school bus. If a master switch is installed, any portion of the brake system that relies on electrical current for operation shall not be wired through the same switch.

3.E.3. Buses Manufactured After Dec. 31, 1994 through June 30, 2017

- A. Alternator
 - 1. Type A-2 and Type B school buses with a GVWR greater than 15,000 pounds and all Types C and D buses shall be equipped with a heavy-duty truck- or bus-type alternator meeting SAE J180; having a minimum output of 100 amperes or higher, and should produce a minimum current output of 50 percent of the rating at engine idle speed.
 - 2. Alternator belts shall not be damaged or broken.
 - 3. The bus must be capable of providing enough current at 1400 revolutions per minute (RPM) to provide a positive charge to the battery with 80 percent maximum load with all lights and accessories on.
 - 4. Types A and B buses with a GVWR of 15,000 pounds or less equipped with electrical lifts shall have a minimum of 100 ampere alternator.
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School Bus Inspection Manual

Revised January 2026

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- B. Battery
 - 1. For a school bus with a diesel-powered chassis, the battery or batteries must provide a minimum of 1,050 CCA.
 - 2. For a school bus with a gas-powered chassis, the battery or batteries must provide a minimum of 800 CCA.
 - C. Optional Battery Size
 - 1. For a bus with a GVWR of 15,000 pounds or less, a battery with a minimum of 550 CCA may be used only in conjunction with an alternator of 130 amperes. This does not apply to buses with a diesel engine or wheelchair lift.
 - 2. For Type C buses powered by other than diesel fuel, a battery providing at least 550 CCA installed in the engine compartment may be used only in combination with an alternator of 120 amperes.

3.E.4. Buses Manufactured on or After July 1, 2017

- A. Alternator
 - 1. Types A and B buses with a GVWR of 15,000 pounds or less shall have a minimum 130-amp alternator. Buses equipped with an electrically powered wheelchair lift and/or air conditioning shall be equipped with the highest rated capacity available from the chassis original equipment manufacturer (OEM).
 - 2. All buses with a GVWR greater than 15,000 pounds shall be equipped with a heavy-duty truck- or bus-type alternator having a minimum output rating of 200 amps or higher, and should produce a minimum current output of 50 percent of the rating at engine idle.
 - 3. All other buses, other than those described in paragraph A.1. of this section and the high voltage section, equipped with an electrically powered wheelchair lift and/or air conditioning, shall have a minimum alternator output of 240 amps and may be equipped with a device that advances the engine idle speed when the voltage drops to, or below, a preset level.
 - 4. A belt-driven alternator shall be capable of handling the rated capacity of the alternator with no detrimental effect on any other driven components.
 - 5. A direct/gear-drive alternator is permissible in lieu of a belt-driven alternator.
 - B. Battery
 - 1. The storage batteries shall have minimum cold cranking capacity rating (cold cranking amps) equal to the cranking current required for 30 seconds at 0 degrees Fahrenheit and a minimum reserve capacity rating of 120 minutes at 25 amps. Higher capacities may be required, depending upon optional equipment and local environmental conditions.
 - 2. The manufacturer shall securely attach the battery on a slide-out or swingout tray in a closed, vented compartment in the body skirt or chassis frame so that the battery is accessible for convenient servicing from the outside.
 - 3. When in the stored position, the tray shall be retained by a securing mechanism capable of holding the battery tray in position when subjected to a 5g load from any direction.
 - 4. The battery compartment door or cover, if separate from the tray, shall be hinged at the front or top. It shall be secured by a positive operated latching system or other type
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School Bus Inspection Manual

Revised January 2026

fastener. The door may be an integral part of the battery slide tray. The door or cover must fit tightly to the body and not present sharp edges or snagging points.

5. Battery cables shall meet SAE requirements. Battery cables shall be of sufficient length to allow the battery tray to fully extend. Any chassis frame-mounted batteries shall be relocated to a battery compartment on Type A buses.
6. Buses may be equipped with a battery shutoff switch. The switch is to be placed in a location not readily accessible to the driver or passengers.

3.E.5. Electrical System Wiring and Components

Components

Materials in all electrical components shall not contain mercury.

Noise Suppression Switch (Buses manufactured on or after January 1, 2008)

There shall be a manual noise suppression switch installed in the control panel. The switch shall be labeled and alternately colored. This switch shall be an on/off type that deactivates body equipment that produces noise, including at least the AM/FM radio, heaters, air conditioners, fans, and defrosters. This switch shall not deactivate safety systems, such as windshield wipers or lighting systems.

Wiring

All wiring shall conform to current applicable recommended practices of the SAE, and a wiring diagram must be provided and made available.

Note: For additional details on the recommended practice for wiring/electrical component(s), refer to the applicable NSTSP manual based on your vehicle(s) manufacturing year.

3.E.6. Electrical System Inspection Procedure

Battery

- A. Visually and physically inspect the batteries to determine that they are securely mounted and there are no signs of leaking or excessive corrosion.
- B. Crank the engine to ensure there is adequate battery capacity to start the engine.

Cables and Wiring

- A. Visually inspect all electrical cabling and wiring for chafed, frayed, damaged or burnt insulation.
 - B. Visually and physically inspect for corroded or loose connections at the battery terminals. Inspect for unsuitable insulation to electrical cabling.
 - C. Inspect for missing or damaged protective grommets insulating all electrical cables through metal compartment panels. All electrical cabling passing through a metal surface shall pass through an insulated grommet as to provide adequate protection against chafing and shorting.
 - D. Visually and physically inspect for any broken or unsecured mounting of electrical components.
 - E. Visually and physically inspect electrical cabling for securement, routing or any unsecured wiring that may cause chafing or frayed conditions.
 - F. Test noise suppression switch for proper operation.
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School Bus Inspection Manual

Revised January 2026

3.F. Engine

- A. Visually inspect engine and surrounding components for evidence of fluid leaks and loose or damaged components. Inspector shall start engine. While engine is operating, inspector shall visually and audibly monitor engine for proper operation, leaks and unusual noises of engine or components.
- B. Inspect cooling fan per manufacturer's recommendations.
- C. Visually and physically inspect all drive belts for proper alignment and tension per manufacturer's recommendations. All belts shall be free of cracking, frays, fluid, glazing and excessive wear. Inspect belt-tensioner per manufacturer's recommendations.
- D. Visually inspect all hydraulic, coolant, fuel and pneumatic hoses for damage, proper routing, proper type and proper securement. Hoses shall be routed in such a way as to avoid contact with exhaust, rotating or moving engine components or sharp edges. Hoses shall not be cracked, leaking, swollen or chaffed.
- E. Inspect for any critical component that fails to function as designed or any fluid leak that would affect the safe operation of the vehicle.

3.F.1. Air Cleaner (FOR INTERNAL COMBUSTION ENGINES ONLY)

- A. A dry element air cleaner shall be provided.
- B. All diesel engine air filters shall include a latch-type restriction indicator that retains the maximum restriction developed during operation of the engine. The indicator should include a reset control so the indicator can be returned to zero when desired.

3.F.2. Oil Filter

An oil filter with a replaceable element shall be provided and connected by flexible oil lines if it is not a built-in or an engine-mounted design. The oil filter shall have a capacity in accordance with the engine manufacturer's recommendation.

3.G. Exhaust System

- A. The exhaust pipe, after-treatment system and tailpipe shall be outside the bus body compartment and attached to the chassis so no other chassis component is damaged.
 - B. The tailpipe and after-treatment system shall be constructed of a corrosion-resistant tubing material at least equal in strength and durability to 16-gauge steel tubing of equal diameter.
 - C. The tailpipe may be flush with, or shall not extend more than 2 inches beyond, the perimeter of the body for side-exit pipe or the bumper for rear-exit pipe. The exhaust system shall be designed such that exhaust gas will not be trapped under the body of the bus.
 - D. The tailpipe shall exit to the left or right of the emergency exit door in the rear of the vehicle or to the left side of the bus in front of or behind the rear drive axle, or the tailpipe may extend through the bumper. The tailpipe exit location on all Type A-1 or B-1 buses may be in accordance to the manufacturer's standards. The tailpipe shall not exit beneath any fuel filler location, emergency door or lift door.
 - E. The exhaust system shall be insulated in a manner that prevents any damage to any fuel system component.
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School Bus Inspection Manual

Revised January 2026

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- F. The design of the after-treatment systems shall not allow active (non-manual) regeneration of the particulate filter during the loading and unloading of passengers. Manual regeneration systems must be designed such that unintentional operation will not occur.
 - G. For after-treatment systems that require Diesel Exhaust Fluid (DEF) to meet federally mandated emissions:
 - 1. The composition of Diesel Exhaust Fluid (DEF) must comply with [International Standard ISO 22241-1](#). Refer to the engine manufacturer for any additional DEF requirements.
 - 2. The DEF supply tank shall be sized to meet a minimum ratio of three diesel fills to one DEF fill.

3.G.1. Exhaust Leak

A school bus must be equipped with such parts and equipment so arranged and kept in a state of repair as to prevent carbon monoxide or exhaust from entering the interior of the bus.

3.G.2. Muffler

Every motor vehicle shall at all times be equipped with a muffler in good working order that blends the exhaust noise into the overall vehicle noise and is in constant operation to prevent excessive or unusual noise, and no person shall use a muffler cutout, bypass or similar device on a motor vehicle on a street or highway. The exhaust system shall not emit or produce a sharp popping or cracking sound.

3.G.3. Exhaust System Inspection Procedure

- A. Visually and audibly inspect the complete exhaust system, including muffler, diesel particulate filter (DPF) and diesel oxidation catalyst (DOC), for leaks, restrictions and damage and to ensure that exhaust is not discharging directly below the driver or passenger compartment. All exhaust emission control devices shall be installed and operating per the manufacturer's recommendations.
- B. Inspect for the presence and condition of heat shielding over and around all piping, and components where specified by vehicle manufacturer.
- C. Visually and physically inspect all exhaust system mounting hardware for loose, missing or damaged components and secure attachment. Inspect to ensure all clamps are in place and secure.
- D. Visually inspect exhaust system for indications of, and areas likely to result in, burning, charring or damaging the electrical wiring, the fuel supply, or any combustible part of the vehicle.

3.H. Frame

- A. Frame lengths shall be established in accordance with the design criteria for the complete vehicle.
 - B. Making holes in top or bottom flanges or side units of the frame and welding to the frame shall not be permitted except as provided or accepted by the chassis manufacturer.
 - C. Frames shall not be modified for the purpose of extending the wheel base.
 - D. Any secondary manufacturer that modifies the original chassis frame shall provide a warranty at least equal to the warranty offered by the OEM, and shall certify that the modification and other parts or equipment affected by the modification shall be free from defects in material and workmanship under normal use and service intended by the OEM.
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School Bus Inspection Manual

Revised January 2026

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- E. The frame shall not have cracked or broken frame members.
 - F. The body or frame must not be in contact with a tire or any part of the wheel assemblies.
 - G. Any alteration/repair must meet the OEM/manufacture specification.

3.H.1. Frame Inspection Procedure

- A. Visually inspect frame for cracks; loosely attached hardware; and sagging, broken, or unapproved welds to frame, side rail or flange.
- B. Visually and physically inspect all frame crossmembers, attaching hardware, and other structural supports for cracks or deformations.
- C. Inspect for cracked, loose, bent, broken or unapproved welds to frame member that affect the support of functional components (e.g., steering gear, engine, transmission, body parts or suspension). Welding to frame should be performed only by the manufacturer or a designee.

3.I. Fuel System

- A. The chassis manufacturer must provide fuel tank(s) with a minimum 25-gallon capacity. Each tank shall be filled from and vented to the outside of the passenger compartment, and each fuel filler should be placed in a location where accidental fuel spillage will not drip or drain on any part of the exhaust system.
- B. The fuel system shall comply with [FMVSS 301, Fuel System Integrity](#).
 - For buses manufactured on or prior to Dec. 31, 2007, fuel lines must be mounted to obtain maximum possible protection from the chassis frame.
- C. Fuel tank(s) may be mounted between the chassis frame rails or outboard of the frame rails on either the left or right side of the vehicle.
- D. The actual draw capacity of each fuel tank shall be a minimum of 83 percent of the tank capacity.
- E. Installation of alternative fuel systems, including fuel tanks and piping from the tank to the engine, shall comply with all applicable fire codes in effect on the date of manufacture of the bus.
- F. A school bus powered by liquefied petroleum or natural gas must display markings as required by [MSS 169.762](#).
- G. Installation of liquefied petroleum gas (LPG) containers shall comply with National Fire Protection Association (NFPA) 58, Liquefied Petroleum Gas Code as adopted by reference in the Minnesota State Fire Code.
- H. Installation of Compressed Natural Gas (CNG) containers shall comply with [FMVSS 304, Compressed Natural Gas Fuel Container Integrity](#).
- I. The CNG Fuel System shall comply with [FMVSS 303, Fuel System Integrity of Compressed Natural Gas Vehicles](#).

3.I.1. Fuel System Inspection Procedure

- A. Visually inspect all parts of the fuel tank, fuel tank cage and fuel system to include lines, hoses, filters, fill cap and fittings for indications of damage or leaks.
 - B. Visually and physically inspect fuel lines and hoses for proper securement, routing, and missing or loose clamps that may cause chafing or come in contact with electrical components.
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School Bus Inspection Manual

Revised January 2026

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- C. The container must be visually inspected after a motor vehicle accident or fire, or every 36 months or 36,000 miles, whichever comes first – ANSI NGV2.
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3.J. Steering

3.J.1. Kingpin

- A. Visually inspect the kingpin for looseness, damage, or missing or loose fasteners.
 - B. Physically inspect the kingpin for play as follows: With the tire raised off the ground, grasp it at the top and move the wheel assembly in and out. If movement is present, identify the source by following the below procedure:
 - C. Have an assistant fully apply the brakes while rechecking play. If the movement disappears with the brakes applied, the play is in the wheel bearings. If the movement remains, it is most likely in the kingpin area. An assembly that has excessive kingpin play of more than ¼ inch is defective.
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3.J.2. Steering Gear

- ❖ [MSS 169.4501](#)
 - ❖ 49 CFR [393.209 \(d\)](#) and [570.60](#)
 - A. The steering gear shall be approved by the chassis manufacturer and designed to ensure safe and accurate performance when the vehicle is operated with maximum load and at maximum speed.
 - B. If external adjustments are required, the steering mechanism shall be accessible to make adjustments.
 - C. Changes not approved by the chassis manufacturer shall not be made to the steering apparatus.
 - D. There shall be a clearance of at least 2 inches between the steering wheel and the cowl, instrument panel, windshield or any other surface.
 - E. Power steering is required and shall be of the integral type with integral valves.
 - F. The steering system shall be designed to provide a means for lubrication of all wear points that are not permanently lubricated.
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3.J.3. Turning Radius

- A. A chassis with a wheelbase of 264 inches or less shall have a right and left turning radius of not more than 42½ feet, curb-to-curb measurement.
 - B. A chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44½ feet, curb-to-curb measurement.
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3.J.4. Steering Inspection Procedure

Ball and Socket Joints

- A. With the bus on the ground, the inspector shall examine the ball joint nut stud for movement while the steering wheel is being rocked in a back-and-forth action. The inspector shall examine the ball/socket joint for weld repairs.
 - B. Check for lateral and vertical movement by grasping the tie rod and drag link sockets and attempting to laterally and vertically move the ball joint. (Rotational movement will not be considered.) Any motion other than rotational, greater than ⅛ inch that can be detected by movement with two hands with moderate strength in any connecting joint is a defect.
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School Bus Inspection Manual

Revised January 2026

Hoses/Fluids

Visually examine the power steering fluid reservoir for proper fluid level. With the system operating, inspect all system components, hoses and fittings for leaks.

Nuts

Visually examine all tie rods and the pitman arm, drag link, steering arm and tie rod arm for looseness and missing fasteners.

Pitman Arm

- A. While the steering wheel is being rotated in a back-and-forth motion; visually inspect the pitman arm and output shaft connection for looseness at the output shaft joint.
- B. Also inspect the pitman arm for damage, cracks or welded repairs.

Power Steering

- A. Manually manipulate the auxiliary power assist cylinder to check for looseness. Start the bus and rotate the steering wheel in a back-and-forth motion to ensure the power steering pump is operable.
- B. With the engine stopped, inspect the system drive belt(s) for any fraying, cracks or fluid saturation. Check the belt tension. On units equipped with an automatic tensioner, ensure that the tensioner moves freely.
- C. Inspect the fluid reservoir while at operating temperature to ensure that the fluid level is not below the add mark. Inspect for signs of fluid leakage.

Steering

- A. Visually inspect for any modification or other condition that interferes with free movement of any steering component. Turn the steering wheel through a full right and left turn and feel for binding or jamming conditions. Both front wheels must turn to full right or full left without binding or interference.
- B. Inspect turn stops by observing for shiny spots and/or signs of wear due to contact with other vehicle components on the sides of tires, drag links, the pitman arm, shock absorbers or brake lines.

Steering Column/Wheel

- A. Inspect the steering column for any looseness in bolts, clamps, positioning parts or universal joints. Inspect flexible coupling in steering column (if the vehicle is so equipped) for excessive misalignment and tightness of the clamp bolt or nut.
 - B. Inspect the steering column and components for damage, cracks or welded repairs. Inspect the steering wheel to ensure that it is properly positioned and secured.
 - C. Place steering axle wheels in a straight-ahead position, have an assistant turn the steering wheel until movement is observed at the left road wheel, and measure the steering wheel movement from the starting position to the wheel movement position. Compare this measurement to the applicable listing in Table 5: Steering Wheel Free Play Values, below.
-

School Bus Inspection Manual

Revised January 2026

Steering Wheel Free Play Values

Steering wheel diameter (inches)	Lash (inches)
16 or less	4 ¼
18	4 ¾
19	5
20	5 ¼
21	5 ½
22	5 ¾

Table 5

Steering Gear Box

- A. Visually examine the steering gear box for any loose, damaged or missing mounting bolts. Inspect for cracks in the gear box or mounting brackets, or for any obvious welded repairs.
- B. While having an assistant rock the steering wheel back and forth, visually inspect the steering shaft and gear box for any looseness where the steering gear box is mounted to the frame. Visually inspect the steering shaft coupler for cracks, damage or looseness.
- C. With the engine operating, inspect for excessive fluid and/or oil leaks (observable movement of fluid).

Tie Rods/Drag Links

- A. While having an assistant rock the steering wheel back and forth, visually inspect the tie rod ends, crossbar and drag links for any looseness at the steering linkage pivot points.
- B. Check for lateral and vertical movement by grasping the tie rod and drag link sockets, attempting to laterally and vertically move the ball joint (rotational movement will not be considered). Any motion, other than rotational, greater than 1/8 inch that can be detected by movement with two hands with moderate strength in any connecting joint is a defect.
- C. Check the crossbar for structural damage and the crossbar clamps for secure mounting.

3.K. Suspension System Standard

- A. The capacity of springs or suspension assemblies shall be commensurate with the chassis manufacturer's GVWR.
- B. Rear leaf springs shall be of a progressive rate or multi-stage design. Front leaf springs shall have a stationary eye at one end and shall be protected by a wrapped leaf, in addition to the main leaf.

3.K.1. Air Suspension

❖ [49 CFR 393.207](#)

Inspect air suspension (if equipped). Observe that the vehicle is lifting level. With the air system fully charged, inspect for any audible or visual air leakage at the air spring assembly, supply hoses and connections.

School Bus Inspection Manual

Revised January 2026

3.K.2. Axles

The front and rear axle and suspension systems shall have a gross axle weight rating (GAWR) at ground commensurate with the respective front and rear weight loads of the bus loaded to the rated passenger capacity

3.K.2.1. Axle Parts/Members

- A. Visually and physically inspect all front and rear axle components. Inspect all U-bolts and other suspension to axle mounting hardware for cracks, breaks, looseness or improper type.
- B. Inspect axle, axle housing, spring hanger(s), shackles or other axle components for alignment, cracks, breaks and loose or missing items that could result in shifting of an axle from its normal position.
- C. Inspect front axle beam for signs of improper repair (e.g., welding or heating).
- D. Inspect for any worn (beyond manufacturer specifications) or improperly assembled U-bolt, shock, kingpin, ball joint, strut, air spring or positioning components.
- E. Inspect all leaf spring hangers, hanger assemblies or portions of leaf for broken, separated, sagging, bent, abnormally worn (beyond manufacturer specifications), shifted or missing components.
- F. Inspect pins and bushings for wear, off-center spring eye, rubbing shackle or nonsymmetric joints. Inspect for any broken, weak or damaged coil spring and mounting assemblies.

3.K.3. Shock Absorbers

- A. A school bus must be equipped with front and rear double acting shock absorbers compatible with the manufacturer's rated axle capacity.
- B. Visually and physically inspect all hydraulic shock absorbers for leaks, looseness, damage or missing components.

3.L. Tires

- ❖ MSS [169.4501](#) and [169.4502](#)
- ❖ [49 CFR 570.62](#)

- A. Buses manufactured before Jan. 1, 1995 may have different sized tires, but shall not be on the same axle. Therefore, all tires on an axle must be of the same size and construction type – bias ply or radial construction – and must conform to the chassis manufacturer's GVWR.
 - B. Buses manufactured after Dec. 31, 1994: All tires on a vehicle shall be of the same size, and the load range of the tires shall meet or exceed the GAWR,
 - C. Tires and rims must meet the load rating commensurate with the manufacturers GVWR.
 - D. Tires must not have unrepaired fabric breaks or be repaired with a boot or blowout patch. Tires must not have a bump, bulge, knot or separation. Tires must not have exposed or damaged body cords.
 - E. Recapped tires shall not be used on the front axle.
-

School Bus Inspection Manual

Revised January 2026

-
- F. Tires must not be re-grooved or re-cut below the original groove depth when extra under-tread rubber was not provided for this purpose, or the tire is not marked "re-groovable."
 - G. Dual rear tires must be provided, except for Type A school buses.
 - H. Recapped tires are only permitted on the rear wheels.
 - I. Front tires shall not be less than $\frac{4}{32}$ inch in any major tread groove. Use a tread-depth gauge for accuracy.
 - J. Rear tires shall not be less than $\frac{2}{32}$ inch in any major adjacent tread groove. Use a tread-depth gauge for accuracy.
-

3.L.1. Spare Tire

If the bus carries a spare tire, it must be suitably mounted in an accessible location outside the passenger compartment.

3.L.2. Tire Inflation

No bus shall be driven with a flat tire or a tire that has an audible air leak. A tire is flat when the air pressure is 50 percent or less of the maximum inflation pressure as indicated on the tire sidewall.

3.L.3. Traction Assisting Devices (Optional)

- A. If installed sanders must:
 - 1. Be of a hopper cartridge-valve type.
 - 2. Have a metal hopper with all interior surfaces treated to prevent condensation of moisture.
 - 3. Have a capacity of at least 100 pounds.
 - 4. Have a cover on the filler opening of the hopper that screws into place, sealing the unit airtight.
 - 5. Have discharge tubes extending to the front of each rear wheel under the fender.
 - 6. Have no-clogging discharge tubes with slush proof, non-freezing rubber nozzles.
 - 7. Be operated by an electric switch with a telltale light mounted on the instrument panel.
 - 8. Be exclusively driver controlled.
 - 9. Have a gauge to indicate when the hopper(s) require refilling at no less than $\frac{1}{4}$ full.
 - B. Automatic traction chains may be installed.
-

3.L.4. Tire Inspection

- A. Visually inspect that tires are properly inflated and do not have noticeable leaks. [See 393.76 (h)(1), (2)] If pressure is questionable, inspector shall use a tire pressure gauge to verify pressure.
 - B. Visually inspect valve stem for damage and presence of valve cap.
 - C. Visually inspect tire for cuts, wear and any observable bumps or bulges.
 - D. Visually inspect for any front tire worn to less than $\frac{4}{32}$ inch. 5. Visually inspect for any rear tire worn to less than $\frac{2}{32}$ inch.
-

School Bus Inspection Manual

Revised January 2026

-
- E. If a visual inspection cannot determine that the tire meets the minimum depth requirement, the inspector shall use a commercial tire depth gauge to verify tread depth.
 - F. Visually inspect the steer axle (front) to ensure that no recapped, re-grooved tires are present.
 - G. Visually inspect tires for improper wear patterns
 - H. Visually check proper type (i.e., improper load range, or mismatched size on the vehicle).

A. Towing Attachment Points

- B. Front and rear towing devices (i.e., tow hooks, tow eyes, or other designated towing attachment points) shall be furnished to assist in the retrieval of buses that are stuck and/or for towing buses when a wrecker with a wheel lift or axle lift is not available or cannot be applied to the towed vehicle.
- C. Note: prior to August 1, 2026 front and/or rear towing devices were required.
- D. Towing devices shall be attached to the chassis frame either by the chassis manufacturer or in accordance with the chassis manufacturer's specifications.
- E. Each towing device shall have a strength rating of 13,500 pounds each, for a combined rating of 27,000 pounds with the force applied in the rearward direction, parallel to the ground, and parallel to the longitudinal axis of the chassis frame rail. For pulling and lifting purposes, tow hooks must be used simultaneously. For pulling, angularity applied to the tow hooks will decrease their capacity.
- F. The towing devices shall be mounted such that they do not project forward of the front bumper or rearward of the rear bumper.

Note: Type A buses are exempt from the requirement for front tow hooks or eyes due to built-in crush zones.

3.M. Trailer Hitch Receiver

- ❖ MSS [169.4501](#) and [169.4502](#)

Installation of a trailer hitch receiver is permissible, provided it does not extend beyond the rear bumper and follows the chassis manufacturer's specifications.

3.N. Transmission (For Internal Combustion Engines Only)

- A. Automatic transmissions shall have no fewer than three forward speeds and one reverse speed. Mechanical shift selectors shall provide a detent between each gear position when the gear selector quadrant and shift selector are not steering-column mounted.
- B. Automatic transmissions shall have a transmission shifter interlock controlled by the application of the service brake to prohibit accidental engagement of the transmission.

3.O. Wheel Bearings/Hubs

- A. Visually inspect the wheel bearing assemblies for looseness, damage, missing, or loose fasteners. This shall include locking pins, draw keys, caps and bearings.
 - B. Visually inspect for any missing (hub) cap, plug, or filler plug, and for any evidence of a leaking wheel seal.
 - C. Physically inspect the wheel bearing assemblies for play as follows: With the tire raised off the ground, grasp it at the top and move the wheel assembly in and out. If movement is present, identify the source by following this procedure:
-

School Bus Inspection Manual

Revised January 2026

Have an assistant fully apply brakes while rechecking the play. If the movement disappears with brakes applied, then the play is in the wheel bearings. If the movement remains, it is most likely in the kingpin area. The wheel bearing assembly shall not have excessive movement that exceeds .010 ($\frac{1}{100}$) inch measuring at the bearing hub.

- D. Visually inspect A-frames and bushings on Type A vehicles. Inspect bushings for wear, cracking, splitting, or severe extrusion from suspension parts.
- E. For vehicles equipped with "wet hubs" or oil bath hubs the inspector should visually check the site glass for lubricant level.

3.P. Wheel Fasteners

- ❖ 49 CFR [393.205](#) and [570.61 through 570.62](#)

A wheel shall not have any nuts, bolts, studs or lugs that are broken, missing, damaged or loose.

3.Q. Wheels

Visually examine for conditions itemized below.

- A. A tire rim, wheel disc, or spider shall have no visible cracks, elongated bolt holes, or any indications of repair by welding.
 - B. A lock or slide ring must not be broken, cracked, improperly seated, sprung or have mismatched rings.
 - C. The use of multi-piece rims or tube-type tires is not permitted on school buses manufactured after Oct. 31, 2004.
-

School Bus Inspection Manual

Revised January 2026

4. Color

Item/Method of Inspection

4.A. Buses Manufactured before Jan. 1, 1995 see [MN Rules 1993, Chapter 3520](#).

4.B. Buses Manufactured after Dec. 31, 1994

- A. A Multifunction School Activity Bus (MFSAB) shall be exempt from these requirements.
- B. A Head Start bus that is not equipped as a school bus must be painted colors other than national school bus yellow.

4.B.1. Color Requirements

❖ [MSS 169.4501, 169.4502](#) and [169.4503](#)

- A. Body
The school bus body, including the cowl, shall be painted NSBY.
- B. Beltline
The beltline may be yellow with black lettering or black with yellow lettering. The beltline is the area running the length of the bus body immediately below the side windows and above the seat-level rub rail.
- C. Bumper
The bumpers and chassis shall be black.
- D. Fenders and Fenderettes
May be black.
- E. Grill
The grill may be the manufacturer's standard color or chrome.
- F. Hood
The hood may be NSBY, non-reflective yellow or non-reflective black.
- G. Lettering
Unless otherwise specified, all required lettering shall be black.
- H. Roof
Except for the vertical portion of the front and rear roof caps, the roof of the bus, above the drip rails, may be white.
- I. Rub Rails
The rub rails adjacent to the beltline may be black or yellow. All other rub rails must be black.
- J. Signal Lamps (Eight-Ways)
The area around the lenses of alternately flashing signal lamps extending outward from the edge of the lamp 3 inches, plus or minus ¼ inch, to the sides and top and at least 1 inch to the bottom, must be black.
- K. Visor and Hoods
When provided, visors or hoods over the flashing warning signal lamps shall be black.
- L. Wheels
May be silver, gray, white, yellow or black.

School Bus Inspection Manual

Revised January 2026

5. Lamps and Signals

When checking LED (light emitting diode) lighting, if more than 25 percent of the LED's elements fail to illuminate the light must be replaced.

References

- ❖ MSS [169.4501](#); [169.4503](#); [169.47](#); [169.48](#); [169.49](#); [169.51](#); [169.57](#); [169.60](#); [169.64](#).
- ❖ FMVSS [101](#), [108](#) and [131](#)

Exterior					
Item on vehicle	Qty.	Color	Location	Position	Height
5.A. Headlamps	2	White	Front	On the front at the same height, with an equal number at each side of the vertical centerline as far apart as practicable.	Not less than 22 inches nor more than 54 inches above the road surface.
				A daytime running lamps system shall be provided for buses manufactured on or after Jan. 01, 2008.	
5.B. Turn Signals	2	Amber	At or near the front	One on each side of the vertical centerline at the same height and as far apart as practicable.	Not less than 15 inches nor more than 83 inches above the road surface.
			One on each side (Intermediate) After Jan 1, 1998	Left side lamp shall be mounted rearward of the stop signal arm, and the right side lamp shall be mounted rearward of the entrance door.	
			Rear	At least 7 inches in diameter or, if a shape other than round, a minimum of 38 square inches, one on each side of the vertical centerline, and as far apart as practicable.	
5.C. Vehicular Hazard Warning Signal Flasher Lamps	2	Amber	Front	See turn signal (front).	
			Rear	See turn signal (rear).	
				Note: The turn signal lamps must be connected to the chassis hazard warning switch to cause simultaneous flashing of turn signal lamps when needed as a vehicular traffic hazard warning.	
5.D. Clearance Lamps	2	Amber	One on each side on the front of the vehicle	One on each side of the vertical centerline to indicate overall width.	The front clearance lamps shall both be on the same level, as high as practicable, located at a height of not less than 24 inches above the headlamp centers.
			One on each side on the rear of the vehicle	One on each side of the vertical centerline to indicate overall width.	

School Bus Inspection Manual

Revised January 2026

5.E. Identification Lamps	3	Amber	Front	As close as practicable to the top of the vehicle, at the same height, and as close as practicable to the vertical centerline of the vehicle with lamp centers spaced not less than 6 inches nor more than 12 inches apart. Alternatively, the lamps may be located as close as practicable to the top of the cab.	All three on the same level as close as practicable to the top of the vehicle.
	3	Red	Rear	One as close as practicable to the vertical centerline. One on each side with lamp centers not less than 6 inches nor more than 12 inches apart.	All three on the same level, as close as practicable to the top of the vehicle.
5.F. Stop-Arm Lamp System		Red lamps		Non-Reflective Stop Arm: Each side of the stop signal arm must have at least two red lamps.	The lamps must be centered on the vertical centerline of the stop-arm. One lamp must be at the extreme top and other at the extreme bottom.
		Red lamps		Reflective Stop Arm: Option 1: Each side of the stop signal arm may be illuminated with at least two red lamps. Option 2: Letters that form the word "STOP" may be illuminated by outlining each letter, or illuminating the middle of each letter stroke.	The lamps must be centered on the vertical centerline of the stop-arm.
5.G. Side Marker Lamp(s)	2	Amber	One on each side (front)	As far to the front as practicable.	Not less than 15 inches above the road surface.
	2	Amber	One on each side (Intermediate)	At or near the midpoint between the front and rear side marker lamps, if the length of the vehicle is more than 30 feet.	Not less than 15 inches above the road surface.
	2	Red	One on each side (rear)	As far to the rear as practicable.	Not less than 15 inches above the road surface.
5.H. Reflex Reflector(s)	2	Amber	One on each side	At or near the midpoint between front- and rear-side marker lamps, if the length of the vehicle is more than 30 feet.	Between 15 inches and 60 inches above the road surface.
	2	Red	Rear	One on each side of the vertical centerline, as far apart as practicable, and at the same height.	Both on the same level, between 15 inches and 60 inches above the road surface.
	2	Red	One on each side (rear)	As far to the rear as practicable.	Both on the same level, between 15 inches and 60 inches above the road surface.
	2	Amber	One on each side (front)	As far to the front as practicable.	Both on the same level, between 15 inches and 60 inches above the road surface.

School Bus Inspection Manual

Revised January 2026

5.I. Strobe Lamp (Optional)	1	White	Roof	White strobe lamp of double flash type centered on the roof not closer than 12 inches or more than 6 feet from the rear roof edge. Cannot be located forward of a roof hatch. The lamp shall have a single clear lens emitting light 360 degrees with a flash rate of 60 to 120 flashes a minute around its vertical axis. A manual switch and a pilot lamp shall be included to indicate when the lamp is in operation.	
5.J. Tail/Stop Lamps	2	Red	Rear	Two combination lamps with a minimum diameter of 7 inches, or if a shape other than round, a minimum 38 square inches of illuminated area shall be mounted on the rear of the bus just inboard of the turn signal lamps.	On the same level as the turn signal lamps with centers a maximum of 12 inches below the rear window.
	2	Red	Rear (auxiliary stop lamps)	Two combination lamps with a minimum diameter of 4 inches, or if a shape other than round, a minimum of 12 square inches of illuminated area, one each side of the vertical centerline and evenly spaced. Note: A rear auxiliary stop lamp may incorporate the required license plate lamp.	Placed on the rear of the body on the same level between the beltline and the floor line.
5.K. Backup Lamp	2	White	Rear	At least 4 inches in diameter or, if a shape other than round, a minimum of 12 square inches of illuminated area. If placed on the same horizontal line as the brake lamps and turn signal lamps, they shall be to the inside.	No requirement.
5.L. License Plate Lamp	1	White	Rear	At the rear license plate to illuminate the plate from the top or sides. Note: May be combined with auxiliary tail lamp.	No requirement.
5.M. Parking Lamps	2	Amber or White	Front and rear	Additional Lamps Required on All Passenger Cars, and on Multipurpose Passenger Vehicles (MPV), Trucks, and Buses, Less Than 80 inches (2032 MM) in Overall Width On the front, at the same height, symmetrically about the vertical centerline, as far apart as practicable	Not less than 15 inches, nor more than 72 inches
				Note: Parking lamps must be steady burning and activate when the headlamps are on.	
5.N. Stop Lamp (High Mount) (Type III's only)		One red, or two red		On the rear including glazing, with the lamp center on the vertical centerline as viewed from the rear	Not less than 34 inches except for passenger cars. See FMVSS 108, Section 6.1.4.1 Note: Must only be activated upon application of the service brakes or may be activated by a device designed to retard the motion of the vehicle. The lamp must be steady burning. Exceptions may apply. See FMVSS 108, Section 6.1.1.2.

School Bus Inspection Manual

Revised January 2026

Interior					
Item on vehicle	Qty	Color	Location	Position	Height
5.O. Headlamp Dimmer Switch				The dimmer switch must allow the driver to switch between low and high beam intensities.	
5.P. High Beam Headlamp Indicator	1			In view of the driver to indicate high beam headlamps are illuminated.	
5.Q. Turn Signal/Hazard Flasher Indicator	1 or 2			In view of the driver to indicate a turn signal or hazard flashers have been activated.	
5.R. Brake System Indicator Lamp(s)				In view of driver to indicate either failure of a brake system (air/hydraulic, hydraulic/hydraulic, ABS/ESC) or activation of parking brake.	
5.S. Other Required Indicator Lamps				Other required indicator lamps to include but not limited to, glow plug (when applicable), special service door, and TPMS (for vehicles with GVWR of 10,000 lbs or less).	
5.T. Eight-Lamp System Indicator				In view of driver to indicate actuation of the eight-lamp warning signals.	
5.U. Interior Lamps		White	Front to Rear	Positioned to illuminate the aisle.	
5.V. Stepwell Lamp	1	White	Stepwell	Positioned to illuminate the stepwell. The lamp shall be illuminated by an entrance door-operated switch, to illuminate only when headlamps and clearance lamps are on and the entrance door is open.	Optional, but must directly illuminate the steps immediately inside the entrance door.

School Bus Inspection Manual

Revised January 2026

5.W. Back-up Warning Alarm

- ❖ MSS [169.4501](#) and [169.4503](#)

An automatic audible alarm may be installed behind the rear axle and shall comply with the published Backup Alarm Standards (SAE J994b), providing a minimum of 112 dBA, or shall have a variable volume feature that allows the alarm to vary from 87 dBA to 112 dBA sound level, staying at least 5 dBA above the ambient noise level.

5.X. Horn

- ❖ MSS [169.4502](#), and [169.68](#)

A bus shall be equipped with a horn in good working order and capable of emitting a sound audible under normal conditions from a distance of not less than 200 feet.

5.Y. Lamps/Signals Inspection Procedure

- Visually inspect all lamps, such as brakes, turn signals, tail, head (low beam), overhead warning lights (amber and red), hazard warning, and stop arm lights to ensure proper visibility, orientation, and operation. Turn signals should flash at a rate of 60 to 120 times per minute.
 - Inspect the driver's area for proper operation of: instrument panel lights, warning lights, indicator lights, gauges, and alarms.
 - Inspect that the horn functions and is audible from approximately 200 feet away.
-

School Bus Inspection Manual

Revised January 2026

6. Lettering and Markings

Item/Method of Inspection

This chapter applies to Types A, B, C and D school buses. Only signs and lettering approved or required by state law are permitted to be displayed. Inspect for required, lettering, markings, and reflective material.

6.A. EV Identification Label (Buses Manufactured after Aug 1, 2026)

- A. Each EV school bus shall be identified with a permanent, diamond-shaped label located on the exterior vertical surface or near-vertical surface on the lower right rear of the school bus other than on the bumper of the vehicle.
- B. The label shall be a minimum of 4.7 inches long x 3.0 inches high.
- C. The marking in the label shall consist of a blue colored background, a border, and the letters "EV", one inch in height with the lightning bolt in the center.
- D. In addition to the location on the right rear, labels shall be affixed to each side of the school bus, rear of the entrance door and beneath the driver's window.

Example:



Figure 8

- E. Battery disconnect label
 1. A permanent label with black one-inch letters shall identify the location(s) of the battery disconnect switch or device.
 2. Any instructions may be printed adjacent to the switch or device in letters ½ inch high.

6.B. Fuel System (LPG)

A school bus powered by liquefied petroleum or natural gas must display markings as required by [MSS 169.762](#).

Note: For complete fuel system requirements, review [3.I](#) in this manual.

6.C. Notice of Recording Devices

❖ [MSS 121A.585](#)

If a video or audio recording device is placed on a school bus, the bus also must display a sign or signs, conspicuously placed, notifying riders that their conversations or actions may be recorded.

6.D. Prohibited Lettering

Lettering on a school bus shall be limited as specified in this section and state law.

School Bus Inspection Manual

Revised January 2026

6.E. School Bus Signs

- A. The bus body shall bear the words "SCHOOL BUS" in black letters at least 8 inches high on both the front and rear of the body or on signs attached thereto. Lettering shall be placed as high as possible without impairment of its visibility. Letters shall conform to "Series B" of Standard Alphabets for Highway Signs.
- B. Buses Manufactured on or before August 1, 2026: "SCHOOL BUS" lettering shall have a reflective background, or as an option, may be illuminated by backlighting.
- C. Buses Manufactured after August 1, 2026: "SCHOOL BUS" lettering shall have a reflective background and may be illuminated.
- D. MFSABs are exempt from these requirements.

6.F. School Bus Identification; other requirements

- ❖ [MSS 169.4503 subdivision 13](#)
- A. Identification numbers must appear on the sides and rear of the bus.
 - B. Symbols or letters may be used on the outside of the bus near the entrance door so that students can identify them. The symbol or letters shall not exceed 64 square inches.
 - C. Each bus shall display the school district serviced, company name, or the owner of the bus within the beltline area.
 - D. The rear of each bus shall display "Unlawful to pass when red lights are flashing" in 2-inch black letters on a NSBY background. This message shall be displayed directly below the upper window of the rear door. On rear-engine buses, it shall be centered at approximately the same location. This applies to school buses manufactured after Dec. 31, 1994.
 - E. In lieu of paragraph D, a Type A, B, C or D bus may be equipped with a changeable electronic message sign on the rear of the bus that:
 1. Displays one or more of these messages: "Caution/Stopping," "Unlawful to pass," "Stop /Do not pass," or similar messages approved by the commissioner.
 2. Displays messages in conjunction with bus operation and activation of pre-warning flashing amber signals, flashing red signals, or stop-signal arm, as appropriate.
 3. Is a supplemental warning system (10.8.D.4, Supplemental Warning System) under [MSS 169.4503, subdivision 31](#).

6.G. School Bus Identification (optional)

Other lettering, numbering or symbols that may be displayed on the exterior of the bus shall be limited to:

- A. Bus identification number, minimum 12-inch-high characters, on top of the bus, in addition to required numbering on the sides and rear.
 - B. The location of the battery(ies) identified by the word "BATTERY" or "BATTERIES" on the battery compartment door in 2-inch lettering.
 - C. Manufacturer, dealer or school identification or logos.
 - D. Identification of fuel type in 1-inch lettering adjacent to the fuel filler opening.
 - E. Identification of charging port on a Battery-Electric Bus in one-inch lettering adjacent to the port location.
-

School Bus Inspection Manual

Revised January 2026

6.H. Tax Exempt Buses

❖ [MSS 168.012](#)

All vehicles displaying tax-exempt license plates must have the name of the operating organization/entity plainly displayed on both sides of the vehicle. This identification must be in a color that contrasts with the part of the vehicle on which it is placed and must endure throughout the term of the registration. Types A, B, C, and D school buses must adhere to the school bus color requirements outlined in [Chapter 4, Color](#). The identification must not be on a removable plate or placard and must be kept clean and visible at all times. Exception: A removable plate or placard may be utilized on vehicles leased or loaned to a political subdivision.

6.I. Reflective Material

- A. The front and/or rear bumper may be marked with non-contrasting retroreflective material. It must be applied diagonally 45 degrees down toward the centerline of the pavement with 2-inch wide strips (plus or minus ¼ inch).
 - B. The rear of the bus body shall be marked with strips of retroreflective NSBY material to outline the perimeter of the back of the bus using material that conforms to the requirements of [FMVSS 131, School Bus Pedestrian Safety Devices, Table 1](#). The perimeter marking of rear emergency exits per [FMVSS 217, Bus Emergency Exits and Window Retention and Release](#), and/or the use of retroreflective "SCHOOL BUS" signs, partially accomplishes the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of retroreflective NSBY material, a minimum of 1 inch and a maximum of 2 inches in width, shall be applied horizontally above the rear windows and above the rear bumper, extending from the rear emergency exit perimeter, marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips. MFSABs shall be exempt from these color requirements.
 - C. "SCHOOL BUS" signs, if not a lighted design, shall be marked with retroreflective NSBY material as the background for lettering of the front and/or rear "SCHOOL BUS" signs.
 - D. Sides of the bus body shall be marked with at least 1¾ inch retroreflective NSBY material, extending the length of the bus body and located (vertically) between the floor line and the beltline. The effective date is Jan. 1, 1998.
-

School Bus Inspection Manual

Revised January 2026

PLACEMENT OF RETROREFLECTIVE MARKINGS

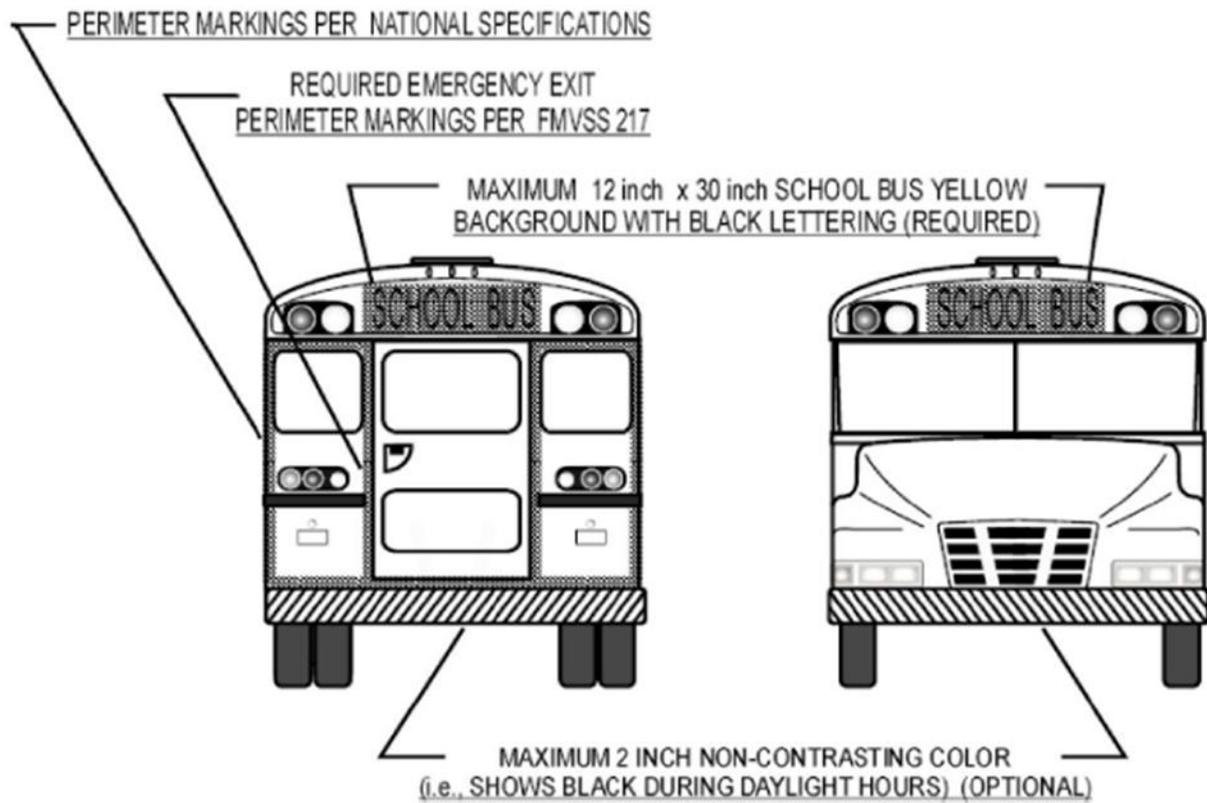


Figure 9

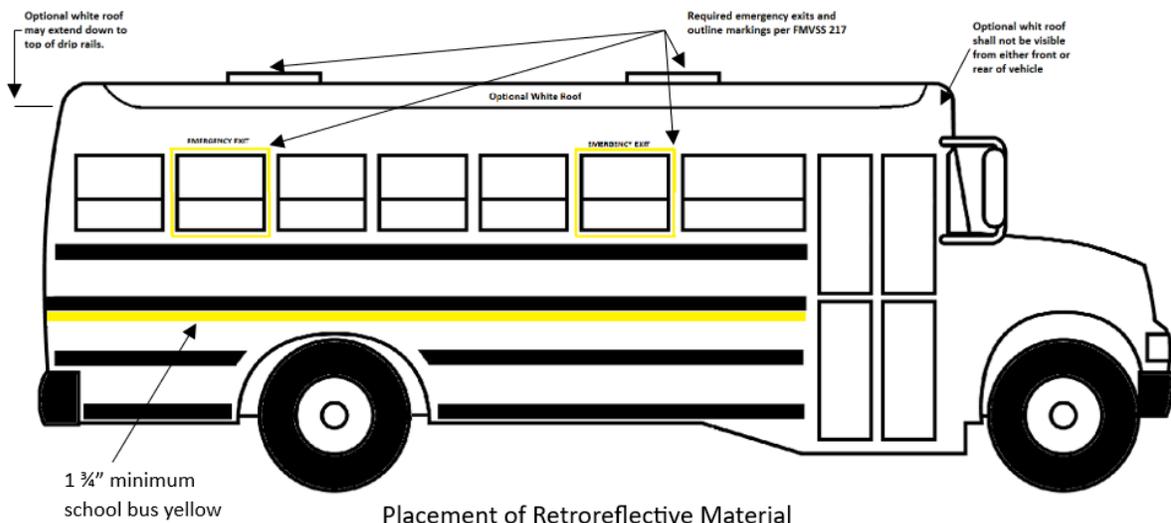


Figure 10

School Bus Inspection Manual

Revised January 2026

7. Safety Equipment

Item/Method of Inspection

7.A. Body Fluid Cleanup Kit

School buses shall have a removable, moisture-proof body fluid cleanup kit that is mounted and identified as a body fluid cleanup kit.

Contents

- A. Buses manufacture on or before August 1, 2026: The package of materials must include, but is not limited to, latex gloves, disposal bag and absorbent material, used to clean up spills of potentially infected bodily fluids, under OSHA's Bloodborne Pathogens regulations and Universal Precautions practices; also known as a hygiene kit.
- B. Buses manufactured after August 1, 2026

Item:	Quantity
Antiseptic BZK Towelettes	4
Biohazard bag with tie	2
Gloves	4
Face mask/eye shield	1
Fluid solidifier – minimum 10g	1
Plastic scoop	1
Scoop bag	1
Paper towels	4
Germicidal wipes	2
Personal protection hair cover	1
Gown	1
Hand sanitizer – minimum .9g	1

School Bus Inspection Manual

Revised January 2026

7.B. First Aid Kit

The bus shall have a removable, moisture- and dust-proof first aid kit in an accessible place in the driver's compartment. The location for the first aid kit shall be marked.

The first aid kit must have the following units and packages per unit as outlined in Charts 1 and 2. First aid supplies must be replaced if they are used.

Chart 1

Required supplies for buses manufactured before Jan. 1, 1995.

Unit Size	10 Unit	24 Unit	36 Unit
4-inch compress bandage	2	6	8
2-inch compress bandage	1	3	7
1-inch adhesive compress	2	2	4
40-inch triangular bandage	1	2	4
4-inch gauze bandage	0	2	4
Absorbent gauze compress	0	2	2
24 x 72-inch gauze compress	1	2	2
Padded tongue blades (Only to be used as a splint)	1	1	1
1-inch x 2 ½-yard adhesive tape*	2	2	2
Wire splint	0	2	2
Note: Chart 2 may be used in lieu of Chart 1.			
Capacity 1-16	Capacity 17-42	Capacity >42	
10 Unit	24 Unit	36 Unit	

Chart 2

Required supplies for Types A, B, C and D buses manufactured after Dec. 31, 1994.

Unit Size	Quantity
1-inch x 2 ½-yard adhesive tape rolls	2
3-inch x 3-inch sterile gauze pads	24
3-inch x ¾-inch adhesive bandage	100
2-inch bandage compress	8
3-inch bandage compress	10
2-inch x 6-foot sterile gauze roller bandages	2
39-inch x 35-inch x 54-inch (approx.) non-sterile triangular bandage	2
36-inch x 36-inch sterile gauze pads	3
Eye pads, sterile	3
Scissors, rounded-end	1
Medical examination gloves (pair)	1
Mouth-to-mouth airway	1

School Bus Inspection Manual

Revised January 2026

7.C. Fire extinguisher

- A. The bus shall be equipped with at least one UL-approved, pressurized, dry chemical fire extinguisher. The extinguisher shall be secured in a mounted bracket located in the driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher and shall be easily read without moving the extinguisher from its mounted position.
- B. The fire extinguisher shall have a rating of 2-A:10-BC, or greater. The operating mechanism shall be secured with a type of seal that will not interfere with the use of the fire extinguisher.

7.D. Seat Belt Cutter

NOTE: This subpart does not apply to Type III vehicles.

- A. Buses manufactured before Jan. 1, 2008 and equipped with passenger restraints shall be equipped with a seat belt cutter. The seat belt cutter must be designed to prevent injury during use, and it must be stored in a safe but accessible location.
- B. Buses manufactured Jan. 1, 2008 through Dec. 31, 2012 shall be equipped with a seat belt cutter with a full-width handgrip and a protected, replaceable or non-corrodible blade. It shall be mounted in a location accessible to a seated driver in an easily detachable manner.
- C. Buses manufactured after Dec. 31, 2012 and equipped with wheelchair- or passenger-restraint devices shall be equipped with an additional seat belt cutter. There is no specific location requirement for the second cutter.

7.E. Triangle Warning Devices

Each school bus shall contain at least three retroreflective triangle road warning devices that meet the requirements of [FMVSS 125, Warning Devices](#). They shall be mounted in an accessible place.

7.F. Fire Suppression Systems (Optional)

- A. The chassis manufacturer may provide an automatic fire extinguisher system in the engine compartment.
- B. Fire suppression system shall include audio and visual alerts to notify the driver that the system has been activated.

7.G. Emergency Equipment Inspection Procedure

- A. Any piece of emergency equipment may be mounted in an enclosed compartment, provided the compartment is labeled in not less than one-inch letters, identifying each piece of equipment contained therein.
 - B. Visually inspect that the fire extinguisher is readily accessible to the driver and passengers, that it is fully charged, is of proper type and size, is properly secured, and has a working pressure gauge.
 - C. Visually inspect any other state-required equipment such as first aid kits, body fluid kits, webbing cutters, and emergency reflectors, and ensure that these items are fully stocked, functional, and properly secured.
-

School Bus Inspection Manual

Revised January 2026

8. Student Pedestrian Safety

Item/Method of Inspection

When checking light emitting diode (LED) lighting, if more than 25 percent of the LEDs fail to illuminate, the light is considered inoperative.

8.A. Crossing Control Arm

- ❖ MSS [169.4501](#) and [169.4503](#)

All buses manufactured for use in Minnesota after Jan. 1, 2013, shall be equipped with a crossing control arm mounted at the right front corner of the front bumper. The crossing control arm shall be automatically activated whenever the bus is stopped with the flashing red signals in use. A crossing control may be installed on a school bus manufactured before Jan. 1, 2013. If installed, it must function properly.

- A. When opened, this arm shall extend in a line parallel to the body side and aligned with the right front wheel.
- B. All components of the crossing control arm and all connections shall be weatherproofed.
- C. The crossing control arm shall incorporate system connectors (electrical, vacuum or air) at the gate and shall be easily removable to allow for towing of the bus.
- D. The crossing control arm shall be constructed of non-corrodible or nonferrous material or shall be treated in accordance with the body sheet metal specification. (See [Chapter 1, Metal Treatment](#).)
- E. There shall be no sharp edges or projections that could cause injury or be a hazard to students. The end of the arm shall be rounded.
- F. The crossing control arm shall extend a minimum of 70 inches (measured from the bumper at the arm assembly attachment point) when in the extended position. The crossing control arm shall not extend past the end of the bumper when in the stowed position.
- G. The crossing control arm shall extend simultaneously with the stop signal arm(s), activated by stop signal arm controls.
- H. An automatic recycling interrupt switch may be installed for temporarily disabling the crossing control arm.
- I. The assembly shall include a device attached to the bumper near the end of the arm to automatically retain the arm while in the stowed position. That device shall not interfere with normal operations of the crossing control arm.

8.B. School Bus Signal Lamps (Eight Lamp Warning System)

- ❖ MSS [169.442](#), [169.4501](#), [169.4503](#)
- ❖ [FMVSS 108](#)

- A. Installation of an alternately flashing eight-lamp warning system must comply with [FMVSS 108](#) and the following regulation for all lamps on the exterior of the vehicle.
 1. Each alternately flashing signal lamp must be mounted with its axis substantially parallel.
 2. Alternately flashing signal lamps must be mounted on the same horizontal centerline and above the windshield and at the rear on the same horizontal centerline so that the lower edge of the lens is not lower than the top line of the side window. The vertical and lateral vision of the front

School Bus Inspection Manual

Revised January 2026

and rear alternately flashing signal lamps must not be obstructed by any part of the body or lamp-house insofar as standard bus body construction permits.

3. The system must be wired so the amber signal lamps are activated only by hand operation, and if activated, are automatically deactivated and the red signal lamps are automatically activated when the bus entrance door is opened.
4. An amber pilot lamp and a red pilot lamp shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

8.C. Stop-Arm System

- ❖ MSS [169.442](#) and [169.4501](#)
 - ❖ [FMVSS 131](#)
- A. The stop-arm must be installed on the left outside of the body near the front. It shall meet the requirements of [FMVSS 131, School Bus Pedestrian Safety Devices](#). The stop-arm shall be on an octagonal shape with white letters and border, and a red background.
 - B. It must extend and retract automatically in conjunction with the flashing red warning lamps and must be activated and deactivated by the entrance door switch.
 - C. It shall be either reflective or equipped with flashing lamps (incandescent, LED, or strobe). The stop-arm lamps shall be connected to the alternately flashing red warning lamps. The stop-arm shall be vacuum, electric or air operated. If reflectorized material is used, it shall have no damaged area on either side of the arm.
 - D. A reflective stop-arm may be equipped with optional alternately flashing red lamps.
 - E. School buses may be equipped with a stop-arm mounted on the left rear corner of the school bus if it complies with [FMVSS 131](#). When two stop signs are installed on the school bus, the rear-most sign shall not be reflectorized, or contain any lettering, symbols, or markings on the forward side.
 - F. Every school bus stop-arm shall be shaped, operate and be kept in working order as outlined in this section. It must extend and retract automatically in conjunction with the alternately flashing red signal lights and must be activated and deactivated by the entrance door switch.
 - G. Stop-arm LEDs that form the word "STOP" shall form the complete shape of the letters.

8.C.1. Stop-Arm Lamp Requirement

- A. Non-reflective sign
Shall have at least two red lamps. The lamps shall be centered on the vertical centerline of the stop arm. One of the lamps shall be located at the extreme top of the stop arm and the other at its extreme bottom.
- B. Reflective sign
Each side of the stop signal arm may be illuminated with at least two red lamps installed on a reflective stop sign. The lamps must be centered on the vertical centerline of the stop-arm. Any optional lamp that is inoperative is considered a defect.

The legend of the retroreflective stop arm may be illuminated in a manner such that light is emitted from the surface of each letter or from the area immediately surrounding each letter. Only red lamps may be used. They shall form the complete shape of each letter of the legend, and shall be affixed to all letters (or to the areas immediately surrounding all letters) in the legend. The shape of each letter shall remain constant. When the stop arm is extended, the lamps

School Bus Inspection Manual

Revised January 2026

shall flash at the 60 to 120 flashes per minute. All lamps shall be positioned in one of the two following ways:

1. Centered within the stroke of each letter of the legend, or
2. Outlining each letter of the legend.

Note: inoperable lights on a reflective sign do not constitute an out of service defect.

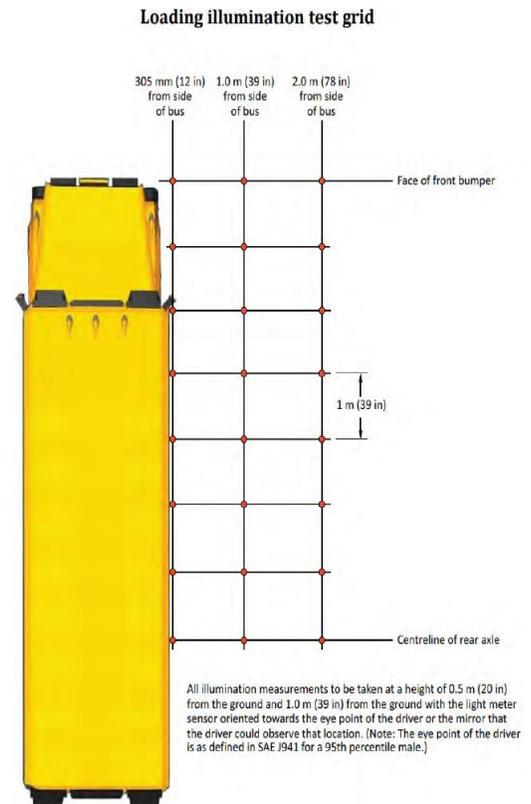
8.D. Optional Systems

School buses may be equipped with the following safety equipment devices.

8.D.1. Exterior Lighting for Loading Zone

If equipped, an exterior lamp or lamps to illuminate an area on the right side of the bus and shall;

- A. Project white light;
- B. Have the illumination of the area tested for compliance, with the entrance door and all windows closed, to produce a minimum illumination of 10 lux when measured at each point on the grid, as indicated in Figure 10, at a height of 0.5 m (1.6 ft) and 1.0 m (3.3 ft) above the ground, with the light meter positioned so that it measures incident light on a plane oriented perpendicular to the observation direction, either from the eye point of the driver or the mirror so that the driver could observe that location;
- C. Direct its light in a manner that prevents the light from shining directly into the right side rear-view mirror and crossover mirror;
- D. If not disabled by the noise suppression switch, turn on when the door is opened and when the ignition power is on;
- E. Turn off approximately five seconds after the door has closed.
 - An additional switch or other means may be installed to allow the driver to temporarily de-activate the operation of the exit lamp(s).



8.D.2. Exterior Student-Control System

❖ [MSS 169.442](#)

In addition to equipment required under subdivision 1, and notwithstanding section 169.64, a school bus may be equipped with a driver-activated, exterior student-control warning system. The driver shall activate this system when the use of the stop-signal arm and flashing red signals is required under section [169.443](#).

School Bus Inspection Manual

Revised January 2026

8.D.3. Strobe Light

- ❖ MSS [169.442](#); [169.4501](#); and [169.64](#),

The strobe lamp may be wired to activate with the amber alternately flashing signal lamps, continuing through the full loading or unloading cycle

8.D.4. Supplemental Warning System

- ❖ [MSS 169.442, subdivision 6](#)

In addition to the signals required under [MSS 169.442, subdivision 1](#), a Type A, B, C or D school bus may be equipped with a supplemental warning system under section [MSS 169.4503, subdivision 31](#). They shall be meet the following;

- Limited to amber and red,
 - Used in conjunction with activated overhead amber and red warning,
 - Automatically activated with eight-way system,
 - Flash at a rate of 60 to 120 flashes per minute by either:
 - Randomized flash pattern, or
 - Alternating with the corresponding overhead light
 - Installed in pairs, mounted on the same level and placed as wide as practicable on the body above the bumper level.
-

School Bus Inspection Manual

Revised January 2026

9. Specially Equipped School Buses

Item/Method of Inspection

Alterations that would permanently return the vehicle to conventional passenger seating (removal of all wheelchair securement positions) must include removal of the power lift and rendering the special service door inoperable unless the special service door meets the emergency exit requirements.

9.A. Aisles

- ❖ MSS [169.4501](#) and [169.4504](#)

All school buses equipped with a power lift shall provide at least a 12-inch aisle leading from the wheelchair position to at least one emergency door and special service entrance.

A wheelchair securement position shall never be located directly in front of (blocking) a power lift door location.

9.B. Identification (International Symbol)

Specially equipped school buses shall display the International Symbol of Accessibility below the window line. Such emblems shall be white on blue or black background, shall not exceed 12 inches square in size, and shall be of a high-intensity retroreflective material meeting the requirements of [FHWA FP-85, Section 718, Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects](#).

9.B.1. Buses Manufactured on or Before August 1, 2026

One label meeting the requirements above shall be displayed below the window line.

9.B.2. Buses Manufactured After August 1, 2026

Three labels meeting the requirements above shall be located as follows: one on the front, one on the rear of the bus body or bumper, and one on the special service entrance.

9.C. Occupant Restraint

- ❖ MSS [169.4501](#) and [169.4504](#)

Inspect vehicles with securement devices for occupant restraints according to the following criteria.

A. General Seat Belt Requirements (for all seating positions)

1. Inspect seatbelt webbing for cuts, fraying, or extreme/unusual wear
2. Inspect buckle and latch for damage and proper operation by inserting the latch, listening for an audible click, tugging the latch against the buckle and attempting to withdraw it, then pushing buckle release button to eject latch;
3. Inspect shoulder upper anchorage guide; webbing must move freely through anchorage guide
4. Inspect shoulder belt height adjuster (if equipped); it must slide freely and be free from damage. If equipped with mechanical adjustments, the adjuster must lock at each height position;
5. Inspect retractor for proper operation; webbing must fully retract;
6. Inspect buckle mounting and shoulder webbing anchorage hardware. Ensure that all items are properly installed and free from damage.

School Bus Inspection Manual

Revised January 2026

B. Special Restraining Devices

Special restraining devices such as shoulder harness, lap belts and chest restraint systems shall be installed to the seats if the devices do not require the alteration, in any form, of the seat, seat cushion, framework or related seat components. The restraints must be for the sole purpose of restraining students with disabilities.

C. Child Restraint/Child Safety Seating

1. On power lift-equipped school buses with a GVWR of 10,000 pounds or more, seat frames may be equipped with attachment points to which belt assemblies can be attached for use with child safety restraint systems (CSRSs) that comply with [FMVSS 213, Child Restraint Systems](#). Any belt assembly anchorage shall comply with [FMVSS 210, Seat Belt Assembly Anchorages](#).
2. Alternatively, a child restraint anchorage system that complies with [FMVSS 225, Child Restraint Anchorage Systems](#), may be installed.
3. Seat belt assemblies, if installed, shall conform to [FMVSS 209, Seat Belt Assemblies](#).
4. Child safety restraint systems shall conform to [FMVSS 213](#).
5. Verify child seat expirations (if applicable).

9.D. **Power Lift Requirements**

- A. All school buses designed with a power lift shall have the lift located on the right side of the bus body.

Note: The lift may be located on the left side of the bus if is used to deliver students exclusively on the left side of a one-way street.

- B. The lift shall be capable of lifting a minimum weight of 800 pounds.

Note: School buses manufactured before Jan. 1, 1995 must be equipped with at least a 750-pound lift capacity and be capable of lifting the wheelchair, occupant and school bus attendant.

- C. A resettable circuit breaker shall be installed between the power source and the lift motor if electrical power is used. It shall be located as close to the power source as possible, but not within the passenger/driver compartment (see [MSS 169.4501](#)).

9.D.1. **403 Standard**

❖ [FMVSS 403](#)

This standard applies to platform lifts manufactured on and after April 1, 2005, that are designed to carry standing passengers, who may be aided by canes or walkers, as well as persons seated in wheelchairs, scooters and other mobility aids, into and out of motor vehicles.

The following components must be installed and working to be in compliance with the 403 standards:

- Threshold warning system.
 - Hand pendant needs to be backlit.
 - On/off switch.
 - 25-lb. bridge plate sensor adjustment.
 - Handrails need to be reinforced and capable of withstanding 250 lbs. in any direction.
-

School Bus Inspection Manual

Revised January 2026

- Outboard roll-stop must be up and locked before the platform is 3 inches above the ground.
- 50 lb. weight stow pressure.
- Cycle counter.
- Manual backup system.
- A label with the words "DOT Public Use Lift."
- Interlocks – The platform lift system must have interlocks or operate in such a manner when installed according to the installation instructions to prevent vehicle movement unless the platform is stowed. It must also prevent the operation of the platform lift from the stowed position until vehicle movement is inhibited.

9.D.2. 404 Standard

❖ [FMVSS 404](#)

This standard applies to motor vehicles manufactured on and after July 1, 2005, that are equipped with a platform lift designed to carry standing passengers who may be aided by canes or walkers, as well as persons seated in wheelchairs, scooters and other mobility aids, into and out of the vehicle.

- Platform lighting.
- The lift must be installed exactly per the manufacturer's instructions.

9.D.3. Lifts/Vehicles Manufactured Before July 1, 2005.

- A. The lift platform shall have a minimum of a 30-inch clear usable width, unobstructed by required hand rail(s). The minimum clear length of the platform between the outer edge barrier and inner edge shall be 40 inches (48 inches for school buses manufactured after Jan. 1, 1998).
 - B. Controls shall be provided to allow the operator to operate lift from inside or outside the school bus. The lift shall be designed to prevent falling due to a power failure or single component mechanical failure. The lift shall be designed with a manual backup in the event of a power failure. All lift controls must be portable and conveniently located on the inside of the school bus lift door.
 - C. The platform edge and sides shall be designed to restrain wheelchairs or other mobile devices from slipping or rolling off. Additionally, the platform must be covered with a skid-resistant material or be designed to prevent slipping. It must be constructed to permit vision through that portion of the platform covering the window of the special service door when in the stowed position. The outer-edge barrier shall be automatically or manually lowered when the platform is at ground level.
 - D. The power lift must be designed so the lift will not operate unless the special service door(s) is opened.
 - E. At least one handrail shall be installed. The handrail shall be approximately 25 to 34 inches in height, a minimum of 18 inches in length and designed to fold when in the stowed position.
 - * Buses manufactured after Jan. 1, 1998 require two hand rails with a height of 30-38 inches above the platform.
 - F. Lift design shall prevent excessive pressure that could damage the lift system when the platform is fully raised or lowered, or prevent vehicle jacking. Lift travel shall allow the platform to rest securely on the ground.
-

School Bus Inspection Manual

Revised January 2026

9.E. Ramps

❖ [49 CFR 38.23](#)

- A. If a ramp is used, it shall be of sufficient strength and rigidity to support at least 600 lbs. over an area of 26 by 26 inches. It shall be equipped with a protective flange on each longitudinal side to keep the special device on the ramp.
- B. The surface of the ramp shall be constructed of nonskid material. Shall not have protrusions from the surface greater than 1/4 inch high; shall have a clear width of 30 inches; and shall accommodate both four-wheel and three-wheel mobility aids.
- C. The transition from roadway or sidewalk and the transition from vehicle floor to the ramp may be vertical without edge treatment up to 1/4 inch. Changes in level between 1/4 inch and 1/2 inch shall be beveled with a slope no greater than 1:2.
- D. Handrails. If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1 1/4 inches and 1 1/2 inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

9.F. Special Service Entrance

- A. The special service entrance and door shall be located on the right side of the bus and shall be designed not to obstruct the regular service entrance.
Note: A special service entrance and door may be located on the left side of the bus if the bus is used only to deliver students to the left side of one-way streets and its use is limited to that function.
- B. The doorpost, headers and all floor sections around this special opening must be reinforced to provide strength and support equivalent to adjacent side wall and floor construction of an unaltered model.
- C. A drip mold must be installed above the opening to effectively channel the water away from the entrance.

9.G. Special Service Entrance Door(s)

- A. A single door or double doors may be used for the special service entrance.
 - B. A single door shall be hinged to the forward side of the entrance unless this would obstruct the regular service entrance. If the door is hinged to the rearward side of the doorway, the door shall utilize a safety mechanism that will prevent the door from swinging open should the primary door latch fail. If double doors are used, the system shall be designed to prevent the door(s) from being blown open by the aerodynamic forces created by the forward motion of the bus, and/or shall incorporate a safety mechanism to provide secondary protection should the primary latching mechanism(s) fail.
 - C. Door materials, panels and structural components shall have strength equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering and other exterior features shall match adjacent sections of the body.
-

School Bus Inspection Manual

Revised January 2026

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- D. All doors shall be weather sealed.
 - E. When manually operated dual doors are provided, the rear door shall have at least a one-point fastening device to the header. The forward-mounted door shall have at least three one-point fastening devices. One shall be to the header, one to the floor line of the body, and the other shall be into the rear door. The door and hinge mechanism shall have strength that is greater than, or equivalent to, the strength of the emergency exit door.
 - F. All doors shall have positive fastening devices to hold doors in the "open" position when the special service entrance is in use.
 - G. Each door shall have windows set in a waterproof manner that are visually similar in size and location to adjacent non-door windows. Glazing shall be of the same type and tinting (if applicable) as standard fixed glass in other body locations.
 - H. Special service entrance doors shall be equipped with padding at the top edge of the door opening. The padding shall be at least three inches wide and one inch thick and shall extend the full width of the door opening.
 - I. Doorways in which lifts are installed shall be equipped with a special light that provides a minimum of two foot-candles of illumination measured on the floor of the bus immediately adjacent to the lift during lift operation.
 - J. Door(s) shall be equipped with a device that will activate an audible or visible signal located in the driver's compartment when the door(s) is not securely closed and the ignition is in the "on" position.
 - K. A switch shall be installed so that the lift mechanism will not operate when the lift platform door(s) is closed.

9.H. Support Equipment and Accessories

- A. In addition to the webbing cutter required in 7.D, Seat Belt Cutter, each specially equipped school bus that is set up to accommodate wheelchairs or other assistive or restraint devices with webbing attached shall contain an additional webbing cutter that is properly secured in a location to be determined by the purchaser. The webbing cutter shall have a full-width handgrip and a protected, replaceable or non-corrodible blade.
- B. Special equipment or supplies that are used in the bus for mobility assistance, health support, or safety purposes shall meet local, federal, and engineering standards that may apply, including requirements for proper identification. Equipment that may be used for these purposes includes, but is not limited to:
 - 1. Crutches, walkers, canes and other ambulating devices to assist ambulation;
 - 2. Medical support equipment. This may include respiratory devices, such as oxygen bottles (which should be no larger than 38 cubic feet of compressed gas), or ventilators. Tanks and valves should be located and positioned to protect them from direct sunlight, bus heater vents, or other heat sources. Other equipment may include intravenous and fluid drainage apparatuses;
- C. Each specially equipped school bus that is set up to accommodate wheelchairs or other assistive restraint devices shall be equipped with an emergency evacuation device that is certified and tested to withstand at least a 300-pound load when used as an emergency stretcher or drag. This evacuation device shall be properly secured to the bus in a location to be determined by the purchaser.

Note: This only applies to buses manufactured on/after July 1, 2017

School Bus Inspection Manual

Revised January 2026

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- D. If transporting oxygen, refer to SAE J3043 Equipment Mount Testing: These mounts may be tested in accordance with the requirement of SAE J3043. (Ambulance Equipment Mount Device or Systems).
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9.I. Wheelchair Tie Down and Occupant Restraint System (WTORS)

- ❖ MSS [169.4501](#) and [299A](#)
- ❖ 49 CFR [38.23](#)
- ❖ FMVSS [222](#)
- ❖ SAE J2249

For purposes of understanding the various aspects and components of this section, the terms “securement” and “tie down” and the phrases “securement system” or “tie down system” are used exclusively in reference to the devices that anchor the wheelchair to the vehicle. The term “restraint” and the phrase “restraint system” are used exclusively in reference to the equipment that is intended to limit the movement of the wheelchair occupant in a crash or sudden maneuver. The term “wheelchair tie down and occupant restraint system (WTORS)” is used to refer to the total system that secures the wheelchair and restrains the wheelchair occupant.

Wheelchair securement devices installed in any vehicle must be maintained in working order and according to the manufacturer's recommendations.

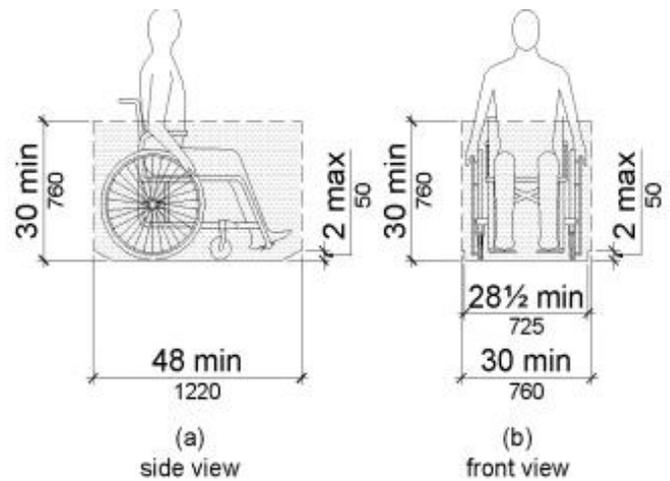
A. WTORS General Requirements

1. A wheelchair tie down and occupant restraint system installed in specially equipped school buses shall be designed, installed and operated for use with forward-facing wheelchair-seated passengers and shall comply with all applicable requirements of [FMVSS 222](#), [School Bus Passenger Seating and Crash Protection](#) and SAE J2249, Wheelchair Tie down and Occupant Restraint Systems for Use in Motor Vehicles.
 2. The WTORS, including the anchorage track, floor plates, pockets or other anchorages, shall be provided by the same manufacturer or shall be certified to be compatible by manufacturers of all equipment/systems used.
 3. Wheelchair securement positions shall be located such that wheelchairs and their occupants do not block access to the lift door.
 4. A device for storage of the WTORS shall be provided. When the system is not in use, the storage device shall allow for clean storage of the system, keep the system securely contained within the passenger compartment, provide reasonable protection from vandalism, and enable the system to be readily accessed for use.
 5. The WTORS, including the storage device, shall meet the flammability standards established in [FMVSS 302, Flammability of Interior Materials](#).
 6. The following information shall be provided with each vehicle equipped with a securement and restraint system:
 - a. A phone number where information can be obtained about installation, repair and parts. (Detailed written instructions and a parts list shall be available upon request.)
 - b. Detailed instructions regarding use, including a diagram showing the proper placement of the wheelchair/mobility aids and positioning of securement devices and occupant restraints, including correct belt angles.
-

School Bus Inspection Manual

Revised January 2026

7. The WTORS manufacturer shall make training materials available to ensure the proper use and maintenance of the WTORS. These may include instructional videos, classroom curriculum, system test results or other related materials.
- B. Wheelchair Securement/Tiedown: See [FMVSS 222, S5.4.1, S5.4.2](#). Each wheelchair position in a specially equipped school bus shall have a minimum clear floor area of 30 inches laterally by 48 inches longitudinally. Additional floor area may be required for some wheelchairs. Consultation between the user and the manufacturer is recommended to ensure that adequate area is provided.
- C. Check for a Type II seat belt assembly with an upper torso portion at each wheelchair position (See [FMVSS 222, S5.4.3 and S5.4.4](#)). If the upper torso belt anchorage is higher than 44 inches measured from the vehicle floor, an adjustment device, as part of the occupant restraint system, shall be supplied as a part of the occupant restraint system – NSTSP.



Wheelchair or Mobility Aid Envelope

Figure 12

9.J. Specially Equipped Bus Inspection Procedure

- A. Inspect service doors (handles, hinges, glass, and door hold open feature).
- B. Lift Inspection: visually inspect and operate wheelchair lift to ensure proper function as designed.
 1. Inspect for fluid leaks (stowed position and during operation);
 2. Inspect lift platform retention hardware (missing or broken);
 3. Inspect switch controls for operation and OEM wiring;
 4. Ensure that all pinch points are protected for operator and passenger safety;
 5. Inspect all safety functions as designed and in compliance with FMVSSs 403/404. Inspect visual and audible alarm, platform, inner/outer barrier pressure, shift/brake interlock.
- C. Occupant and Wheelchair Securement Inspection
 1. Verify that each wheelchair position has a minimum clear floor area of 30 inches in width by 48 inches front to back;

School Bus Inspection Manual

Revised January 2026

2. Visually inspect to account for complete securement sets for each position;
3. Inspect for broken or missing hardware, frayed or torn webbing, and lap/shoulder belt condition;
4. Inspect to ensure that all components for each wheelchair position are compatible in accordance with manufacturers' specifications;
5. Visually and physically inspect all anchorage points, tracking, and fasteners for securement.

If the vehicle is equipped with a ramp, it shall be inspected to ensure compliance with ADA requirements for transportation vehicles as outlined in 49 CFR 38.23. See also the recommended out-of-service items for specially-equipped vehicles.

School Bus Inspection Manual

Revised January 2026

10.Type III School Bus

❖ [MSS 169.454](#)

This section applies to Type III vehicles used for the transportation of school children when owned and operated by a school district or privately owned and operated. All related equipment provided on the vehicle must comply with federal motor vehicle safety standards where applicable. If no federal standard applies, equipment must be to manufacturer's standard.

In addition to this section (Chapter 10), Chapter 1 through 5 and 9 where applicable will be the basis for the inspection procedure.

Item/Method of Inspection

10.A. Body Fluid Cleanup Kit

A body fluids cleanup kit is required and it must be contained in removable, moisture- and dust-proof containers mounted in an accessible place within the driver's compartment and must be marked to indicate the identity and location.

Package of materials including, but not limited to, latex gloves, disposal bag and absorbent material, used to clean up spills of potentially infected bodily fluids, under OSHA's Bloodborne Pathogens regulations and Universal Precautions practices; also known as hygiene kit.

10.B. Fire Extinguisher

A minimum of a 10-BC rated dry chemical-type fire extinguisher is required. The extinguisher must be mounted in a bracket, be located in the driver's compartment, and be readily accessible to the driver and passengers. A pressure indicator is required and must be easily read without removing the extinguisher from its mounted position.

10.C. First Aid Kit

A minimum of a 10-unit first aid kit is required. It must be contained in removable, moisture- and dust-proof containers mounted in an accessible place within the driver's compartment and must be marked to indicate the identity and location.

Note: reference 10 Unit column in Chart 1 in [7.B](#).

10.D. Equipment Location Label

If emergency equipment is not in view of the driver a label must be placed in the driver and front passenger area clearly indicating the location of these items.

10.E. Lettering and Markings

The vehicle must not have the words "school bus" in any location on the exterior of the vehicle, or in any interior location visible to a motorist.

10.E.1. Notice of Recording Devices

❖ [MSS 121A.585](#)

If a video or audio recording device is placed on a school bus, the bus also must display a sign or signs, conspicuously placed, notifying riders that their conversations or actions may be recorded.

School Bus Inspection Manual

Revised January 2026

10.E.2. Tax Exempt Vehicles

❖ [MSS 168.012, subdivision 1\(k\)](#)

All vehicles displaying tax-exempt license plates must have the name of the operating organization/entity plainly displayed on both sides of the vehicle. This identification must be in a color that contrasts with the part of the vehicle on which it is placed and must endure throughout the term of the registration. Types A, B, C, and D school buses must adhere to the school bus color requirements outlined in Chapter 4, Color. The identification must not be on a removable plate or placard and must be kept clean and visible at all times. Exception: A removable plate or placard may be utilized on vehicles leased or loaned to a political subdivision.

10.F. Mirrors

- A. Line of vision must not be distorted, discolored, flaking or cracked.
- B. Two exterior clear rearview mirrors must be provided, one to the left and one to the right of the driver. Each mirror must be firmly supported and adjustable to give the driver a clear view past the left rear and the right rear of the bus.
- C. The interior clear rearview mirror must afford a good view of pupils and roadway to the rear.

10.G. Prohibited Equipment

❖ [MSS 169.454](#) and [169.64](#)

- A. Installation and use of the eight-lamp warning system is prohibited. All lamps on the exterior of the vehicle must conform with and be installed as required by [FMVSS 108](#).
- B. Installation and use of a stop signal arm is prohibited.
- C. Installation of any other prohibited light.

10.H. Vehicle Age

Vehicles model year 2007 or older must not be used as type III vehicles to transport school children, except those vehicles that are manufactured to meet the structural requirements of federal motor vehicle safety standard 222, Code of Federal Regulations, title 49, part 571.

10.I. Vehicle Color

A Type III vehicle must be painted a color other than NSBY.

School Bus Inspection Manual

Revised January 2026

11. Out Of Service Criteria

STATE INSPECTION PROGRAMS

School bus safety programs vary greatly from state to state. Each state is urged to establish a neutral third-party inspection program. Personnel conducting school bus safety inspections must be knowledgeable in the mechanical components of a school bus and be aware of all the applicable construction standards, laws, rules and all other requirements of their jurisdiction.

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INSPECTION PROCEDURE

School bus safety inspections should consist of a standardized inspection where vehicles are placed out-of-service based on uniform criteria. States should also develop specific inspection regulations, rules, procedures and out-of-service criteria for all vehicles utilized in student transportation. States are encouraged to develop a system to compile the data for analysis.

OUT-OF-SERVICE CRITERIA

The purpose of criteria is to identify critical school bus components and provide tolerances that inspectors can utilize to determine if a school bus is safe for student transportation. While it is recognized that each state may enforce more stringent standards, this document is intended to establish a baseline for inspecting and placing school buses out-of-service.

RESOURCE INFORMATION

2025 National School Transportation Specifications and Procedures

49 CFR PARTS 570.1-570.63, *Vehicle in Use Inspection Standards*

49 CFR PARTS 400-599, *Federal Motor Vehicle Safety Standards*

49 CFR PARTS 393, 396, *Federal Motor Carrier Safety Regulations*

49 CFR APPENDIX A to Subchapter B, *Minimum Periodic Inspection Standards*

Commercial Vehicle Safety Alliance (CVSA), *North American Uniform Out-of-Service Criteria*

Note: References to these citations below may include only the number for brevity; e.g. (393.203) instead of (49 CFR, Part 393.203).

School Bus Inspection Manual

Revised January 2026

BODY EXTERIOR

- A. Any panel, rub rail or trim that is loose, torn, dislocated or protruding from the surface of the bus, creating a hazard (393.203);
- B. Any engine, battery or other door that is not properly secured (393.203);
- C. Three or more adjacent floor sills/body crossmembers broken or detached (393.201);
- D. Any area of the floor that is sagging or soft due to broken body crossmembers (393.201);
- E. Any body crossmember, outrigger or other structural support which is cracked, missing, deformed, or has rust holes where damage affects the safe operation of the vehicle.

BODY INTERIOR

Aisle

- A. Aisle does not have the required clearance (571.217);
- B. Obstructions in aisle that prevent passengers from egress to emergency exits (393.62) (393.203).

Door (Entrance)

- A. Student entrance door does not open or close properly;
- B. Door control handle does not lock in the closed position;
- C. Door is equipped with a padlock or similar locking device (excludes interlock systems).

Floor

Floor not maintained to prevent slipping or tripping by passenger(s).

Handrail

- A. Handrail loose or missing;
- B. Handrail fails the nut/drawstring test as defined by NHTSA.

Panels

Any panel (e.g., ceiling, side or wheel well) protruding, having sharp edges or not secured so is likely to cause injury.

Seat(s) and Barrier(s)

- A. Any seat or barrier that is not securely attached to the vehicle (393.91);
- B. Any seat or barrier material(s) that compromises the integrity of compartmentalization and occupant protection (571.222);
- C. Seat spacing fails to comply with 571.222;
- D. Any part of an equipped occupant safety restraint assembly is missing, not properly installed, not accessible or defective as to prevent proper securement of the occupant [393.93(a)(b)] (571.209);
- E. Driver seat fails to maintain adjusted position (393.93);

School Bus Inspection Manual

Revised January 2026

Stepwell

- A. Any part of the stepwell or support structure that is damaged;
- B. Any part of the stepwell tread that is loose, torn or damaged that would present a tripping hazard.

BRAKE SYSTEM(S)

Adjustment

Any one brake beyond the adjustment limit (See [Table 3 and 4](#): Brake Adjustment Specifications.)

Air System

- A. Absence of effective braking action upon application of service brakes [393.48 (a)]; ©
- B. Audible air leak in the system at a location other than a proper connection; ©
- C. If an air leak is discovered and either the primary or secondary reservoir pressure is not maintained when these conditions exist [396.3(a)(1)]: ©
 - 1. Governor is cut-in;
 - 2. Reservoir pressure is between 80-90 psi;
 - 3. Engine is at idle; and
 - 4. Service brakes are either fully applied or released;
- D. Inoperative or defective primary or secondary air pressure gauge; ©
- E. Low air warning device is inoperative, missing or fails to function as designed; ©
- F. Air compressor (normally to be inspected when readily visible or when conditions indicate compressor problems.)
 - 1. Loose compressor mounting bolts [396.3(a)(1)];
 - 2. Cracked, broken or loose pulley. [396.3(a)(1)];
 - 3. Cracked or broken mounting brackets, braces or adapters. [396.3(a)(1)].
- G. Air reservoir tank separated at either end from the attachment point(s) [396.3(a)(1)];
- H. Chamber size mismatched on axle [393.47(b)];
- I. Mismatched brake chamber long stroke versus regular stroke [393.47(b)];
- J. Mismatched slack adjuster length [393.47(c)];
- K. Any bus manufactured after October 20, 1994 not equipped with automatic slack adjusters, [571.121];
- L. Automatic slack adjuster fails to compensate for wear, {571.121};
- M. Loose, broken or missing component (e.g., chambers, spiders, support brackets, mounting hardware, springs clevis pin) (393.48); ©
- N. Any non-manufactured holes or cracks in the spring-brake-housing section of a parking brake. [396.3(a)(1)]. ©

School Bus Inspection Manual

Revised January 2026

Brake Shoe/Pad/Lining

- A. Any lining thickness less than allowed by 393.47;
- B. Lining pad is cracked, broken, not firmly attached or missing (393.47) (*surface or heat cracks in the lining should not be considered out of service*);
- C. The friction surface of drum, rotor or friction material are contaminated by oil, grease or brake fluid (393.47); ©
- D. Fails to make contact with drum/rotor (e.g., frozen, binding, uneven) [393.48(a)];

Drums

- A. External crack(s) that open upon application [393.47(a)]; ©
- B. Any portion of the drum missing, broken, misplaced [393.47(a)];
- C. Drum has evidence of metal-to-metal contact on the friction surface [393.47(d)(1)]; ©
- D. A drum surface that is worn beyond the limits established by the manufacturer [393.47(g)].

Hoses and Tubing

- A. Brake hose with any damage extending through the outer reinforcement ply [393.45(a)]; ©
- B. Audible leak at other than a proper fitting or connection [393.45(a)]; ©
- C. Any bulge or swelling when brakes are applied [393.45(a)]; ©
- D. Any restriction due to cracked, broken or crimped line/hose [393.45(a)];
- E. Any line, tubing, hose or connection that is not constructed to meet standard (571.106).

Hydraulic Brake System

- A. Brake failure warning system is missing, inoperative, disconnected, defective, or activated while the engine is running with or without brake application [393.51(b)];
- B. Reservoir is below minimum level [393.45(a)] (571.106);
- C. Any seeping, leaking or swelling of hose(s) under pressure [393.45(a)];
- D. Any leak in master cylinder unit [393.45(a)] (571.106);
- E. Any observable fluid leak in the brake system;
- F. Absence of effective braking action upon application of service brakes [393.48(a)] ©;
- G. No pedal reserve with engine running [393.40(b)]; ©
- H. Brake-power-assist unit is inoperative [396.3(a)(1)]; ©
- I. Hydraulic-brake-backup system is inoperative [396.3(a)(1)]; ©
- J. The master-cylinder assembly has loose or missing mounting bolts or is not secured causing it to shift out of its normal position [396.3(a)(1)]. ©

School Bus Inspection Manual

Revised January 2026

Parking Brake

- A. Fails to hold vehicle in stationary position on normal roadway conditions (absence of ice or snow) in forward or reverse (393.41) [571.105 S5.2.1 and S5.2.3(b)];
- B. Parking brake warning lamp fails to function as designed.

Rotors

- A. Any rotor with a flexural crack that passes completely through the rotor to the center vent from either side, completely through a solid rotor, or completely through a structural support connecting the rotor friction surfaces [393.47(a)];

Note: This does not include hairline heat cracks.

- B. A rotor surface that is worn beyond the limits established by the rotor manufacturer [393.47(g)];
- C. Rotor has severe rusting or pitting on the rotor friction surface on either side (light rusting on the friction surface is normal) [393.48(a)];
- D. Any portion of the rotor (disc) missing or in danger of falling away [393.47(a)]; ©
- E. Rotor has evidence of metal-to-metal contact on the friction surface [393.47(d)] .©

BUMPERS

- A. Front bumper is missing or not properly secured [393.203(e)];
- B. Rear bumper is missing or not properly secured (393.86).

CHASSIS/FRAME

- A. Any cracked, loose, sagging or broken frame rail [393.201(a)];
- B. Any damage permitting the shifting of the body or imminent collapse of frame [393.201(a)];
- C. Any cracked, loose, broken frame member affecting support of functional components (e.g., steering gear, engine, transmission, body part of suspension [393.201(a)]. ©
- D. Any condition that causes the body or frame to be in contact with a tire or any part of the wheel assemblies [396.3(a)(1)] ©;
- E. Any alteration/repair not meeting OEM/manufacturer specifications;
- F. Any frame crossmember or other structural support which is cracked, missing, or deformed that affects the structural integrity of the vehicle (393.201);

Differential

Cracked or leaking housing [393.207(a)].

Driveshaft/Driveline

- A. Center Bearing (Carrier Bearing) ©
 - 1. Any broken or loose center bearing bracket, bracket bolts, or mounting hardware [396.3(a)(1)];
 - 2. Any center bearing bracket crack equaling 50 percent or more of the original

School Bus Inspection Manual

Revised January 2026

- bracket width [396.3(a)(1)];
3. More than ½ inch vertical movement (with hand pressure only) of the shaft in the center bearing carrier [396.3(a)(1)].
- B. Driveshaft guard loose, missing, improper placement or bent (393.89);
- C. Driveshaft Tube ©
1. Any original metal crack in the shaft tube greater than ¼ inch in length [396.3(a)(1)];
 2. Obvious cracked welds at shaft-tube end [396.3(a)(1)];
 3. Any shaft tube with an obvious twist [396.3(a)(1)].
- D. Universal joint(s)
1. Worn, faulty, or obviously welded repair [393.209(2)(d)];
 2. Any independent vertical movement between opposing yoke ends greater than 1/8 inch, with hand pressure only [396.3(a)(1)]; ©
 3. Any missing, broken, or loose universal joint bearing cap [396.3(a)(1)];
 4. Any missing, broken or loose universal joint bearing cap bolt, bearing strap, or retainer bolt [396.3(a)(1)]; ©
 5. Any bearing cap retainer clip that is missing [396.3(a)(1)]. ©
- E. Yoke Ends (including Slip Yoke, Yoke Shaft, Tube, and End Fitting Yoke) ©
1. Any visible crack in a yoke end [396.3(a)(1)];
 2. Any yoke-mounting hardware loose (with hand pressure only), broken, or missing [396.3(a)(1)];
 3. Any horizontal or vertical movement of slip joint yoke shaft of greater than ½ inch, with hand pressure only [396.3(a)(1)];
 4. Any loose, broken or missing end fitting fastener [396.3(a)(1)].

ELECTRICAL/HIGH VOLTAGE

- A. Any high-voltage system with a dripping leak at any point;
- B. Damaged or exposed high-voltage cabling;
- C. Broken or damaged charging port on the vehicle.

School Bus Inspection Manual

Revised January 2026

ELECTRICAL/LOW VOLTAGE BATTERY

Battery

- A. Battery not secured (393.30);
- B. Signs of leaking or excessive corrosion;
- C. Battery lacks cranking capacity to start engine.

Cables

- A. Electrical cable insulation chafed, frayed, damaged or burnt, causing bare cable to be exposed [393.28, 396.3(a)(1)]; ©
- B. Loose or corroded connections at battery posts or compromised insulation protection to electrical components [393.28, 393.77(b), 396.3(a)(1)];
- C. Missing or damaged protective grommets insulating main electrical cables through metal compartment panels (393.30). ©

Components

- A. Broken or unsecured mounting of electrical components [396.3(a)(1)]; ©
- B. Electrical cable unsupported, hanging or missing clamps that may cause chafing or frayed conditions [393.28, 396.3(a)(1)]. ©

EMERGENCY EQUIPMENT

- A. Fire extinguisher missing, not of proper type or size, not fully charged, has no pressure gauge, is not secured or is not readily accessible to the driver or passengers, or fails to meet state specifications (393.95);
- B. Any additional state-specific equipment (e.g., first aid kit, body fluid kit, webbing cutter and emergency reflectors) that fails to meet state specifications and places the vehicle out of service;
- C. Missing, unusable or incomplete set of emergency triangles or not properly stored in accordance with FMVSS 571.125.

EMERGENCY EXITS

- A. Any emergency door, window or roof hatch that fails to open freely or completely as defined in 571.217;
- B. Door prop-rod device is missing or inoperative (571.217);
- C. Any emergency exit is equipped with a padlock or similar locking device (excludes interlock systems);
- D. Any vehicle that lacks the required number of emergency exits (571.217);
- E. Any emergency exit that is not properly labeled and marked both inside and outside the vehicle as specified by 571.217;
- F. Any item or modification that reduces the size of the opening and limits egress to the emergency exit by all passengers;

School Bus Inspection Manual

Revised January 2026

- G. Emergency exit warning device is not audible in the driver seating position and the vicinity of the emergency door or window (571.217);
- H. If equipped with an emergency-exit interlock, the vehicle is capable of starting while the emergency-exit lock is engaged or emergency-interlock arm is inoperative when engaged and the key is in the run position (571.217).

ENGINE

- A. Any critical component that fails to function as designed (396.3(a)(1));
- B. Any fluid leak that would affect the safe operation of the vehicle (396.3(a)(1), 396.5 and 393.209);
- C. Any hose/line that is damaged or worn extending through the outer protective layer;
- D. Any hose/line not of approved type for the application;
- E. Any belt that is oil saturated, twisted, dry-rotted, cut, missing sections, or has separated plies;
- F. Any belt worn beyond manufacturer's specification;
- G. Engine oil is not at the appropriate operating level;
- H. Engine is misfiring, or there is excessive hesitation upon acceleration.

EXHAUST SYSTEM

- A. The exhaust system is leaking or discharging directly below or at a point forward of the driver or passenger compartment [393.83(g)]; ©
Note: Does not apply to proper venting for emission systems.
- B. The exhaust discharges below a fuel-fill location, emergency-exit door or lift door;
- C. Any part of the exhaust system so located that it is likely to result in burning, charring or damaging the electrical wiring, the fuel supply or any combustible part of the vehicle [393.83(a)]. ©

FUEL SYSTEM

CNG or LPG Fuels ©

- A. Any fuel leakage from the CNG or LPG system detected audibly or by smell and verified by either a bubble test using non-ammonia, non-corrosive soap solution, or a flammable gas detection meter [396.3(a)(1)].
Note: Verification is needed to ensure that the sound is not either internal to the fuel system (such as gas flowing in a pressure regulator, or pressure equalizing between manifold tanks) or a leak in the air brake system.
- B. Any fuel leakage from the CNG or LPG system detected visibly (evidence such as ice buildup at fuel system connections and fittings) and verified by either a bubble test using non-ammonia, non-corrosive soap solution, or a flammable gas detection meter [396.3(a)(1)].

School Bus Inspection Manual

Revised January 2026

Note: Some brief fuel leakage or decompression may occur during refueling, causing temporary frosting of CNG or LPG fuel system parts. If the vehicle has been refueled shortly before inspection, care must be taken to distinguish these temporary frosting occurrences from actual leaks.

Liquid Fuels

- A. Any part of the fuel tank or fuel system not securely attached to the vehicle (393.65);
- B. A fuel system with a dripping leak at any point of the tank (393.67);
- C. Dripping leak (396.3(a)(1) leak other than tank);
- D. Missing fuel cap or system does not seal as designed.

LAMPS/SIGNALS

- A. Any one of the following required lamps not working: brake, turn signal, tail, head (low beam), school bus overhead warning light(s) (amber or red), hazard warning or stop arm lamp(s) (571.108, 571.131);

Note: Vehicle LED lamps must have more than 25% of the diodes unlit to be considered out of service.

Interpretation: Stop-arms utilizing lamps to illuminate the word "STOP" will be evaluated on a per letter basis related to the percentage (>25%) of permissible diodes being inoperative before the out of service criteria takes effect.

- B. Horn fails to function as designed (393.81);
- C. Any critical brake, telltale lamp, buzzer or gauge that fails to function as designed;
- D. ABS and/or ESC malfunction indicator light not functioning as designed or illuminated on all vehicles required to have ABS and/or ESC;
- E. Stop arm(s) fail to operate with overhead red lights as mandated (571.131);
- F. If equipped, a crossing control device fails to operate as designed.

MIRRORS (571.111)

- A. Any mirror required to provide the driver with the entire field of view, missing, damaged, clouded or otherwise obscured so as to place children in a hazardous position;
- B. Any crossover mirror system or portion thereof that fails to hold a set adjustment;
- C. Any crossover mirrors directed to view any area other than for which they were intended;
- D. Any part of the required field of vision obscured or not visible from the driver's seated position.

School Bus Inspection Manual

Revised January 2026

SPECIALLY-EQUIPPED VEHICLES

- A. Wheelchair lift
 - 1. Lift inoperable;
 - 2. Lift does not function as manufactured;
 - 3. Manual backup system inoperable;
 - 4. Manual backup accessories missing or damaged;
 - 5. Base plate/arms/towers/platform - Any cracked component or cracked weld;
 - 6. Any hydraulic fluid leak;
 - 7. Wiring does not meet manufacturer's specifications;
 - 8. Jacking Prevention – any portion of the vehicle raises off of the ground during lift operation.

- B. Platform lift manufactured after April 1, 2005 must meet all the following criteria, (as referenced in FMVSS 403 and 404):
 - 1. Shift/park brake interlock is inoperable;
 - 2. Lift platform retention device inoperable/hardware missing;
 - 3. Outer barrier, inner-roll stop, and threshold visual/audible warning system inoperable;
 - 4. Stow interlock inoperable;
 - 5. The inner/outer barrier non-deployment or interlock inoperable.

- C. Wheelchair Ramp (ADA 49 CFR 38.23)
 - 1. Any ramp that is cracked or damaged or unable to support a load of 600 lb. for ramps 30 inches or longer or 300 lb. for ramps shorter than 30 inches;
 - 2. Any non-slip resistant surface;
 - 3. Ramp surface has a protrusion greater than ¼ inch;
 - 4. Ramp width of less than 30-inch clear space;
 - 5. Ramp threshold greater than ¼ inch lip with no beveled transition or a bevel with a slope greater than 1:2;
 - 6. Missing/broken/unsecured two-inch barrier on each side of the ramp;
 - 7. Ramp exceeds maximum slope of 1:4 when deployed to ground level or:
 - a. 1:4 if vehicle floor is three inches or less above a six-inch curb; or
 - b. 1:6 if vehicle floor is three to six inches above a six-inch curb; or
 - c. 1:8 if vehicle floor is six to nine inches above a six-inch curb; or
 - d. 1:12 if vehicle floor is greater than nine inches above a six-inch curb;

School Bus Inspection Manual

Revised January 2026

8. Any ramp that is not firmly attached to the vehicle when used for boarding or alighting;
 9. Any gap between the vehicle and the ramp that exceeds 5/8 inch;
 10. Vehicle does not provide for a method of stowage/securement of the ramps;
 11. Ramp impinges on the wheelchair/mobility aid or poses a hazard to passenger or passengers in the event of a sudden stop or maneuver;
 12. Hand Rails (if equipped):
 - a. Not within 30-38 inches above ramp surface;
 - b. Not capable of withstanding a force of 100 lb. without deformation;
 - c. Cross section diameter not between 1¼ inch and 1½ inches;
 - d. Hand rail interferes with mobility aid maneuverability when entering or exiting the vehicle.
- D. Securement Device System
1. Securement device system incomplete set, improperly installed, or damaged;
 2. Floor/ceiling track damaged or unsecured.
- E. Wheelchair Occupant Restraint System
1. Restraint system incomplete or mismatched set;
 2. Lap/shoulder belt, damaged/missing hardware (see "seatbelts/occupant restraints" under the seats section of the "recommended school bus inspection procedure");
 3. Restraint system is not in compliance (571.222).

STEERING SYSTEM

Ball/Socket Joints ©

- A. Any movement under steering load of a nut stud [396.3(a)(1)];
- B. Any motion, other than rotational, between any linkage member and its attachment point of more than 1/8 inch measured with hand pressure only [393.209(d)];
- C. Any obvious welded repair [393.209(d)].

Front Axle Beam ©

Any crack(s) or obvious welded repair [396.3(a)(1)].

Nuts ©

Loose or missing fasteners on tie rod, pitman arm, drag link, steering arm or tie rod arm [396.3(a)(1)].

Pitman Arm ©

- A. Looseness of the pitman arm on the steering gear output shaft [393.209(d)];

School Bus Inspection Manual

Revised January 2026

- B. Any obvious welded repair [396.3(a)(1)] [393.209(d)].

Power Steering

- A. Auxiliary power assist cylinder loose [393.209(e)];
- B. Power steering system leaking or insufficient fluid in reservoir [393.209(2)(e)].

Steering

- A. Any modification or condition that interferes with free movement of any steering component [393.209(d)];
- B. Steering travel restricted through the limit of travel in both directions [570.60(c)].

Steering Column/Wheel ©

- A. Absence or looseness of U-bolts or other positioning part(s) [393.209(c)];
- B. Welded or repaired universal joint(s) [393.209(d)];
- C. Steering wheel not properly secured [393.209(a)];
- D. Steering wheel lash/free play exceeds performance test (see [Table 5](#)) [393.209(b)].

Steering Gear Box ©

- A. Mounting bolt(s) loose or missing [393.209(d)];
- B. Crack(s) in gearbox or mounting brackets (393.209(d)) [396.3(a)(1)];
- C. Any obvious welded repair(s) [396.3(a)(1)] [393.209(d)];
- D. Looseness of yoke-coupling to the steering gear input shaft [393.209(d)].

Tie Rods/Drag Links ©

- A. Loose clamp(s) or clamp bolt(s) on tie rod or drag link(s) [396.3(a)(1)];
- B. Any looseness in any threaded joint [396.3(a)(1)].

SUSPENSION COMPONENTS

Air Suspension ©

- A. Deflated air suspension (one or more deflated air spring/bag) [393.207(f)];
- B. Air spring/bag is missing, broken, or detached at either the top or bottom (393.207(f)).

Axle Parts/Members

- A. Any U-bolt or other spring to axle clamp bolt(s) which are cracked, broken, loose or missing [393.207(a)]; ©
- B. Any axle, axle housing, spring hanger(s), or other axle positioning parts which are cracked, broken, loose or missing that results in shifting of an axle from its normal position [393.207(a)]; ©
- C. Any worn (beyond manufacturer specifications) or improperly assembled U-bolt, shock, kingpin, ball joint, strut, air bag or positioning component [570.61 (a)];
- D. Any leaf spring broken, separated, sagging, bent, abnormally worn (beyond

School Bus Inspection Manual

Revised January 2026

manufacturer specifications), shifted, or missing [393.207(c)];

- E. Any broken coil spring [393.207(d)]; ©
- F. Any suspension component that is loose, cracked, missing, or worn to the extent that the component can be moved by hand (e.g., bushings, sway bar, tracking components, etc.) (393.207).

TIRES/WHEELS/HUBS

Hub

- A. Excessive wheel bearing or kingpin play that exceeds ¼ inch [396.3(a)(1)], (570.61);
- B. Any bearing (hub) cap, plug, or filler plug that is missing or broken, allowing an open view into hub assembly [396.3(a)(1)]; ©
- C. Smoking from wheel hub assembly due to bearing failure [396.3(a)(1)]; ©
- D. When any wheel seal is leaking. This must include evidence of contamination of the brake friction material [396.5(b)];

Note: Grease/oil on the brake lining edge, back of shoe, or drum edge and oil stain with no evidence of fresh oil leakage are not conditions for an out-of-service violation.

- E. Lubricant is leaking from the bearing hub and is accompanied by evidence that further leakage will occur [396.5(b)];
- F. No visible or measurable of lubricant showing in bearing hub [396.5(a)]. ©

Tires

- A. Any tire cut, worn or damaged to the extent that the steel or fabric cord is exposed [393.75(a)];
- B. Any observable bump, bulge, or knot related to sidewall or tread separation [393.75(a)]; ©
- C. Tire has a noticeable leak, or has 50 percent or less of the maximum inflation pressure marked on the tire sidewall [393.75(a)(3)]
- D. So mounted or inflated that it comes in contact with any part of the vehicle [393.3(a)(1)] ©;
- E. Any front tire worn to less than $\frac{4}{32}$ inch [393.75(b)];
- F. Any rear tire worn to less than $\frac{2}{32}$ inch [393.75(c)];
- G. Any school bus operated with regrooved, recapped or retreaded tires on the front axle [393.75(d)];
- H. Any tire not meeting the minimum size and load rating as required per the manufacturer's GVWR;
- I. Any mismatched tire on the vehicle (e.g., load range or size).

Note: load range must meet or exceed the GAWR and all tires shall be the same size on the vehicle.

School Bus Inspection Manual

Revised January 2026

Wheels/Rims/Spiders

- A. Any nuts, bolts, studs, lugs or holes that are elongated, broken, missing, damaged or loose [393.205(b)];
- B. Any cracked or broken wheel or rim [393.205(a)];
- C. Any lock or slide ring broken, cracked, improperly seated, sprung or has mismatched rings [393.205(a)]. ©

WINDOWS

- A. Any glass or glazing that is broken through or missing (393.60);
- B. Any glass not of approved type [393.60(a)];
- C. Windshield has discoloration or other damage in that portion extending upward from the height of the topmost portion of the steering wheel but not including a two-inch border at the top and a one-inch border at each side of the windshield or each panel thereof, except as follows:
 - 1. Color or tint applied by the manufacturer for the reduction of glare;
 - 2. Any crack not over 3/4 inch long, if not intersected by another crack;
 - 3. Any damaged area that can be covered by a disc $\frac{3}{4}$ inch in diameter, if not closer than three inches to any other such damaged area;
- D. Any damage or obstruction to any window forward of the front passenger seat barriers (e.g., chips, clouding, or cracks that obscure the driver's vision [393.60(c)];
- E. No operable defrosting and defogging system to clear the driver's windshield (571.103).

WINDSHIELD WIPERS

- A. Inoperative, missing or damaged wiper (393.78);
- B. Wiper does not clean sweep area of driver's windshield (393.78);
- C. Inoperative or defective windshield washing system (393.78, FMVSS 571.104)